EDITORIAL STAFF

E. L. Shaner
Editor-in-Chief

E. C. Kreutzberg
Editor

A. J. Hain
Managing Editor

E. F. Ross
Engineering Editor

D. S. Cadot
Art Editor

ASSOCIATE EDITORS

G. H. Manlove — J. D. Knox
W. G. Gude — G. W. Birdsall
W. J. Campbell

New York
I. H. Such — B. K. Price
L. E. Browne

Pittsburgh — R. L. Hartford
Chicago — J. F. Powell
Detroit — A. H. Allen
Washington — L. M. Lamm

London
Vincent Delport

BUSINESS STAFF

G. O. Hays
Business Manager

C. H. Bailey
Advertising Service

New York . E. W. Kreutzberg, B. C. Snell
Pittsburgh . . . S. H. Jasper
Chicago . . . L. C. Pelott, W. F. O'Dell
Cleveland . . . R. C. Jaenke, C. N. Schmidt

J. W. Zuber
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York . . . 220 Broadway
Chicago . . Peoples Gas Building
Pittsburgh . 1800 Koppers Building
Detroit . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 582 Sinton Hotel
San Francisco . . 2413 Milvia St.
Berkeley, Calif., Tel. Berk. 7354-W
London . . . . Caxton House
Westminster, S.W. 1
Berlin . Berlin, N.W. 40, Roonstrasse 10

• • •

Published by The Penton Publishing Co., Penton Building, Cleveland, Ohio. John A. Penton, Chairman of Board; E. L. Shaner, President and Treasurer; J. R. Dawley and G. O. Hays, Vice Presidents; F. G. Steinebach, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

Copyright 1938 by the Penton Publishing Co.

STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

Volume 103—No. 4 **July 25, 1938**

READER COMMENTS 7
AS THE EDITOR VIEWS THE NEWS 11
NEWS
- War Department Shaping Plans To Place "Educational Orders" 13
- Machine Tool Orders Continue Upward Trend 15
- Monopoly Investigation "Not for Purposes of Prosecution" 16
- Meetings 16
- Financial News of the Steel Industry 17
- Steelworks Operations for the Week 17
- June and First Half Iron and Steel Exports Down 24
- Britain Makes Drive for Larger Share of Tin Plate Business 24
- More Pig Iron Used in Making Steel, Less Scrap 25
- Men of Industry 26
- Obituaries 27
- Activities of Steel Makers and Users 27
- How Steel Figured in World Flight 28
- Steel Industry's Accident Rate Up Slightly 28

MIRRORS OF MOTORDOM 19
WINDOWS OF WASHINGTON 22
EDITORIAL—Let's Have Real Facts on Monopoly 29
THE BUSINESS TREND
- Index of Activity Registers Sharp Gain 30
- Charts and Statistics 31

TECHNICAL
- Geared Compensation 32
- Spent Pickle Liquor 35

MATERIALS HANDLING
- Making Nuts and Bolts 37

JOINING AND WELDING
- Arc-Length Control 40

HEAT TREATING
- Flame Softening 42

PROGRESS IN STEELMAKING
- Cold Rolled Sheets 48

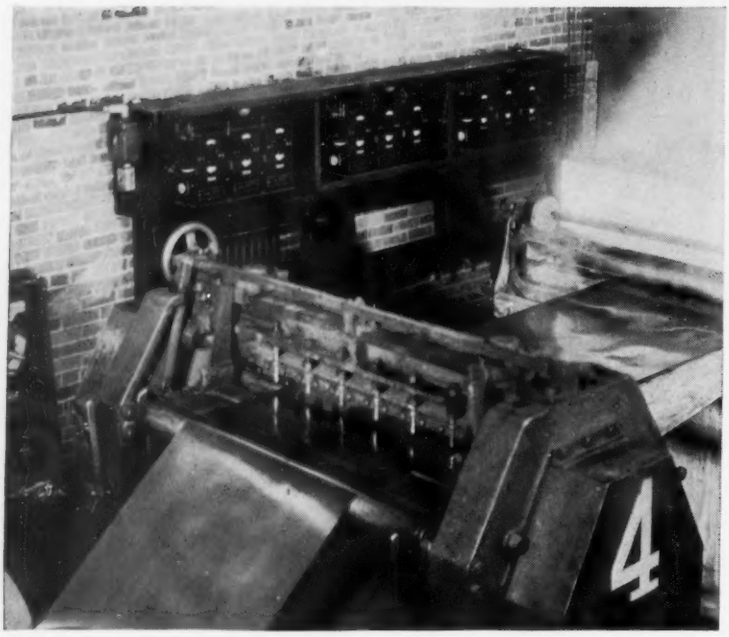
NEW METAL PRODUCTS 51
INDUSTRIAL EQUIPMENT 55
HELPFUL LITERATURE 59
MARKET REPORTS AND PRICES 63
- The Market Week 64

BEHIND THE SCENES 76
CONSTRUCTION AND ENTERPRISE 84
INDEX TO ADVERTISERS 90

PRODUCTION · PROCESSING · DISTRIBUTION · USE

SEE FOR YOURSELF why Foxboro

potentiometer controllers are so accurate and dependable



Battery of nine Foxboro Potentiometer Controllers for three electrolytic cleaning tubs in the Wheeling Steel Plant at Yorkville, Ohio.

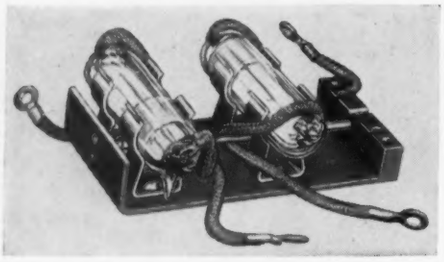
ACCURATE and dependable control is a fact with Foxboro in hundreds of installations, such as the one shown at the left. The slightest variation of temperature causes action, instantly, to restore the desired temperature. Initial cost is less . . . space is saved . . . and maintenance is materially reduced . . . particularly with the Foxboro Multiple Drive.

Some of the many reasons why an ever-increasing number of users is buying Foxboro Pyrometer Controllers are detailed on this page. They will help to explain why users say that no other controller can give you so much for so little. The Foxboro Company, 118 Neponset Avenue, Foxboro, Mass., U. S. A. Branch Offices in 25 Principal Cities.

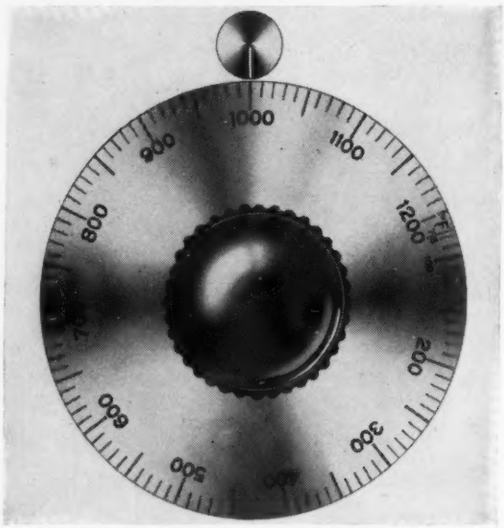
FOXBORO

REG. U. S. PAT. OFF

POTENTIOMETER CONTROLLERS

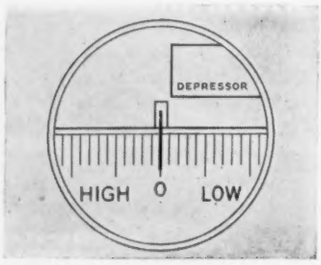


For the most economical and accurate operation for different requirements Foxboro provides two types of control contacts: mercury-in-glass type, and intermittent brush type. Foxboro engineers will gladly recommend the correct type for your specific conditions.

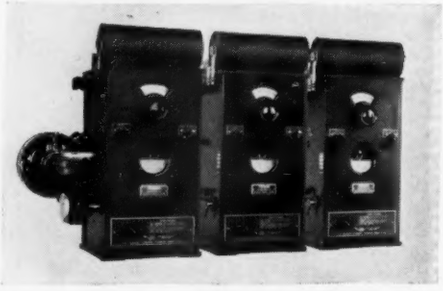


A 12-inch temperature scale is provided on the giant setting dial. Accurate setting is thus assured—an essential step in obtaining accurate temperature control.

All adjustments are outside on the Foxboro Controller. No oiling or attention inside the case is required. Control setting dial . . . mechanical zero adjustment . . . and standardized knobs are grouped conveniently on the front of the Controller.



Knife-edge selectivity is a feature of the Foxboro Controller. As little as two-thousandths of an inch of galvanometer point deflection will cause regulating action. Accurate temperature regulation is assured.



Economy of cost without reduction of efficiency is obtained by Group Drive. Foxboro Controllers may be lined up in batteries of as many as eight, and driven by one motor. See installation above.

As the Editor Views the News

■ LAST week's developments brought conviction that the worst is over in the steel producing and metalworking industries. Increased demand moved steel production (p. 17) up 4 points to 36 per cent of ingot capacity, equal to the best rate so far this year. An especially favorable sign is that the upturn in machine tool sales is developing sooner (p. 15) than expected; buying increased slightly in June and will show a still further improvement in July. While automobile production dipped sharply (p. 20) due to termination of 1938 model schedules, an early improvement is expected when 1939 models come on the lines. That the steel companies are not yet in a satisfactory position, however, is evident from second quarter earnings statements (p. 17), most of which show heavy losses.

• • •

Many Plants; Few Orders

"Educational orders" for war materials, to shorten the period necessary for placing the country on a combative basis in the event of an emergency, will begin to materialize this fall (p. 13), according to present plans of the war department. They are not expected to comprise any undue volume of business; while some 10,000 plants have been earmarked for production of war materials, it is likely that only a small portion of them will receive the orders. . . . England is making a stronger bid for her share of the world's tin plate business (p. 24) on the strength of the new continuous strip mill at Ebbw Vale; of interest is the fact that eight American steelworkers trained in operating such mills embarked at New York last week to get the new unit into production.

• • •

"Not for Prosecution"

The new economics commission is planning to start its monopoly investigation (p. 16) by reviewing the patent situation. Vigorous denial is made by the antitrust division, department of commerce, that this investigation is to be an instrument to obtain evidence for prosecution. . . . Howard Hughes' round-the-world flight again emphasizes the extent to which aviation is dependent on metals. Practically every highly stressed part in the Wright motor in this Lockheed monoplane (p. 28) is of nickel or nickel-chromium steel . . . Unique among new metal products (p. 51) is an automatic electric range with built-in room heating system and equipped to cook with coal, wood or oil. An air circulating system in this unit fits it for use in homes that require a source of heat in the kitchen.

• • •

Flexible Pay Plan

Job security is said to be enhanced and industrial unrest reduced by a flexible pay plan (p. 32) now being used by a number of companies; it is founded on minimum base rates with increases prorated in accordance with volume of business. . . . Four steel wire cloth manufacturers have developed a new process (p. 34) for removing oil after weaving; a small gas-fired furnace replaces more cumbersome equipment. . . . A nut and bolt maker now is buying steel in the unpickled condition (p. 27) and derives important savings through elimination of costly outdoor storage. . . . To eliminate excessive hardness at edges of certain flame-cut steels, flame-softening (p. 42) now is an accepted process; three methods are available for meeting varying application conditions.

• • •

Money in Waste

Important new developments include a method for disposing of spent pickle liquor with profit. In a new plant now under construction (p. 35) 10,000 gallons of spent liquor will be converted daily into 25 tons of a new product designated as Ferron, largely a co-precipitated iron hydroxide and calcium sulphate. It has remarkable insulating and other properties and is believed to have wide potentialities. . . . Efficient use of electrodes and better welding result from a new instrument (p. 40) for promoting arc-length control. One of two flashlights in the operator's helmet lights with a one-volt variation up or down. The instrument is particularly useful in training new operators. . . . A new material (p. 41) is said to prevent adhesion of weld spatter.

E. L. Shaner

MORE POWER

to the National Salesmen's Crusade

To Nash-Kelvinator and the many other manufacturers of consumer goods who have joined them in sponsoring the National Salesmen's Crusade, we of the steel industry express our admiration for a soundly conceived and brilliantly executed idea.

In Lincoln, Neb., you proved that enough people are able to buy, if product and reasons for buying are dramatically presented, to have important effect upon total sales volume. You raised the average from one sale in every twenty calls by outside salesmen to one sale in every ten calls. By this intensified selling test, you proved in a typical American city that the American salesman holds the key to business recovery—that sales mean jobs.

By these efforts to make more jobs in your own industry, you are also lifting the employment curve in all the other industries that serve you.

We are tremendously interested and enthusiastic about the work you are doing, and are anxious to work with you in every constructive way that our facilities afford.

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

War Department Shaping Plans To Place "Educational Orders" This Fall

■ BARRING some unforeseen incident, the war department early this fall will begin work on its so-called "educational" orders for war materials.

This plan has been agitated by the war department for more than ten years but it was not until the closing hours of the last session of congress that an appropriation was obtained. In the deficiency bill as passed provision was made "for placing educational orders to familiarize private manufacturing establishments with the production of the munitions for war of special or technical design, noncommercial in character, as provided in H. R. 6246, $2,000,000."

H. R. 6246 is the authorization bill which was passed by congress and signed on June 16 by the President, providing for an appropriation of $2,000,000 a year for the next five years.

This bill states: "That the first of any such educational orders placed with any person, firm, or corporation for supplying any such munitions, accessories, or parts, may include a complete set of such gages, dies, jigs, tools, fixtures, and other special aids and appliances, including drawings thereof, as may be required for the production of such munitions, accessories, and parts in quantity in the event of an emergency. The title to all such facilities shall remain in the government of the United States.

No Orders Placed Yet

"That not more than one such educational order for the manufacture of the same, or substantially the same, article of special munitions shall be given to the same person, firm, or corporation within any period of three successive years. This section shall not prohibit the awarding of any contract during any war in which the United States is engaged."

Owing to the fact that there has been some loose writing on this subject, industry has been somewhat misled. For instance, it is not generally understood that no orders have been placed by the war department under this authorization.

There is no intimation at this time as to what orders are in prospect, or as to what class of tools, materials or munitions will be purchased at the beginning of the program.

Up to this time, the war department has had no experience with such a plan other than that at the beginning of the World war when American manufacturers were called upon suddenly to produce large quantities of materials.

This educational plan comes directly under the office of Louis Johnson, assistant secretary of war. It is expected Secretary Johnson will appoint a special board of officers to work out proposed orders for their individual branches of the service, and when the work really gets started it will be under the jurisdiction of the war planning division and the current procurement division of the war department.

While details have not been completed, it is understood the metal and minerals division and the machinery division of the department of commerce will be called upon to co-ordinate the work.

The war department has already earmarked some 10,000 manufacturing concerns in the United States which are in a position to handle war materials in case of emergency. The department will be able to issue educational orders only to a very small proportion of these firms. Officials state many of these orders will go to steel manufacturers.

Before the bill providing for these special orders was passed, the department program for industrial

Sweden's Prince Visits American Steelworks

■ **Much interested in American steel manufacture was Sweden's Prince Bertil, recently a guest of Carnegie-Illinois Steel Corp. on a tour of the Homestead, Pa., works. Left to right: D. F. Austin, vice president in charge of sales; Prince Bertil; J. L. Perry, president of Carnegie-Illinois; Walther Mathesius, vice president in charge of operations, United States Steel Corp. of Delaware**

preparedness enabled it to acquaint the prospective manufacturer with drawings and specifications and production schedules pertaining to items which might be required, but few were given an opportunity to produce such items in peacetime.

In short, the manufacturer has had a paper knowledge, but no practical experience concerning munitions which the department depends upon him to produce at specific rates. This is just the point where the new educational orders fit in with the scheme for emergency production.

It is pointed out by officials who are giving their entire time to war planning that successful quantity production, especially of complicated and unfamiliar materials, requires months of study and preparation before a single item can be fabricated. They also say some new arrangement of plant may be required, and special machine tools must be designed and built.

Secretary Johnson has shown great interest in the work and has made a number of speeches about it in recent months. (See STEEL, May 9, p. 15.)

He called attention to the fact that if American industry were given time enough to build up its facilities, to obtain new ones and to establish additional plants to meet the demands of war, the problem would be greatly simplified.

"But time is the very element which an aggressive nation may deny us," he said. "It is toward the successful conquest of time in the early stages of war that the whole program of industrial mobilization is geared. Delay is the greatest enemy to industrial preparedness. To reduce the time factor is to save thousands of valuable lives and untold millions of treasure."

This problem of avoiding delays was said to be a challenge to the war department and industry.

Will Need Smaller Reserves

"Mass production at a rapid rate," he declared, "is a job in which we Americans should be supreme. We have always boasted of our ability as manufacturers. We have always taken pride in our ingenuity that enabled us to get into large scale production quickly on almost any project. Our World war record, however, left much to be desired."

During the course of one of his talks he said "the caliber .30 machine gun Browning rifle is composed of 324 components and requires about 2700 operations, 1400 gages and 2000 jigs, tools and fixtures. The heavy .50 caliber Browning machine gun is composed of approximately 419 components and requires 3460 operations, 1800 gages and 2500 jigs, tools and fixtures."

It is well-known that our arsenals

Louis Johnson
Assistant Secretary of War

are able to supply most of our peace-time needs for munitions to be used by the troops in peace-time training. They are not, however, large enough, or capable of sufficient expansion to take care of the tremendous needs for munitions during an emergency.

The army officers attached to the war department who are specializing in war planning point out that the quicker we can get into production in an emergency, the smaller reserve of munitions we will need to carry in time of peace, to be prepared.

Plan Will Save Time

Representative Smith, Connecticut, making a favorable report on the bill for the house committee on military affairs, said in part: "It takes time, often many months, to make tools, jigs, dies, fixtures, and other aids to manufacturing. The provision of the tools alone, which under this bill would be the property of the war department, would cut down the time, from the beginning of emergency until it was possible for the factories to get into production in quantity, by at least five months on the average. We do not have sufficient reserves of war materials now. We must either provide them or provide some means of acquiring them rapidly after the beginning of an emergency.

"It is not the intention of the committee to allow the war department to purchase its general supplies without regard to the bidding statute. Your committee feels that section 3709 of the revised statutes should be followed in all ordinary purchases. It feels, however, that a limited exception should be made in this case, limited by the amount authorized each year in a long-term program, and also limited by the requirement in the bill that any order under this proposal shall be let only after the specific approval of the President. . . The program will greatly advance our industrial preparedness."

It is understood the war department has made every effort to keep its plan for the organization of industry up to date. Last year the industrial mobilization plan of 1933 was revised.

The supply arms and services now are engaged actively in a complete check-up and readjustment of all allocated facilities. Progress is being made in furtherance of the policy to resurvey all allocated facilities at least once every three years. Loads are being reported and recorded both by item and commodity departments, and by plants as a whole.

Under the principles outlined in the industrial mobilization plan as revised, the adjustment of allocations between the army and the navy has continued through the medium of the army and navy munitions board. Of special significance in this connection has been the action taken to re-apportion the capacity for aeronautical material, powder and explosives, machine tools, and shell forgings.

This matter of educational orders is not by any means a new subject. Many readers of STEEL will recall the work done during the World war by Howard E. Coffin. He was a member of the advisory committee of the council for national defense from 1916 to the end of the war, and was active on several industrial boards during that time. His ability, and experience he gained during the war, made him a competent witness before the war policies commission, established by congress to investigate this subject.

"This commission will not arrive at any effective program of practical preparedness for national defense in a future war," Mr. Coffin testified, "unless it obtains from congress permission for the procurement departments to establish a comprehensive system of educational orders, without the necessity of asking for bids.

Advocates Skeleton Organization

"No other way. . . will assure the skilled mechanics or the manufacturing interests of this country, or can maintain over the years of peace-time, necessary specialized knowledge which they must have if they are to co-operate, without disastrous delay, with the defense department of the government in time of emergency."

Bernard M. Baruch, who was chairman of the war industries board during the war, and who was one of those instrumental in getting American industry into war production, in making a report to President Wilson in December 1919, made certain recommendations for future activities. They are along

the lines of educational orders, as provided in the recent bill.

"Under the supervision of the proper departments of the government," he reported, "some industries must be given encouragement to maintain a skeleton organization through which can be developed the rapid manufacture of guns, munitions, aeroplanes, etc. Some facilities, already developed, might be kept alive through outright purchase or by some orders for munitions and aeroplanes, while at all times there must be kept on hand the necessary dies, jigs, fixtures, etc., needed for the manufacture of munitions.

"The expert personnel of the war and navy departments, in addition to keeping abreast of the times in new war making agencies, should keep the industry of the nation tuned in a skelton form to meet immediately that enlarged demand which would come through war."

Tool Builders More Cheerful as Orders Continue To Increase

■ UPTURN in machine tool sales is developing earlier than expected. Buying reached the low point of the present depression in May, increased slightly in June, and will improve still further in July.

Orders for the first three weeks of July, although not heavy, show a marked gain over the two months preceding, according to representative manufacturers. Resumption of the upward trend has given rise to the belief that fall possibly will find tool builders with substantial orders.

Reasons: Used machine tool market is fairly well cleaned up, always a good omen for new sales; promise of a considerable volume to be released by the aircraft and automotive industries, by the government, and by companies benefiting from government contracts within the next several months; evidence of general business improvement in rising business indexes.

Textile and shoe plants already are figuring or closing on a considerable volume of equipment. The automotive industry, one of those which will benefit first from the government's spending program and the expected general business improvement, is being regarded with new interest. Steel and metalworking companies recently have placed some fair-size orders and are figuring on more.

Tool dealers say that the prompt deliveries generally available now make possible more efficient retooling than would be possible when deliveries are delayed.

The trade generally believes and recent surveys indicate the need for modern machine tools is considerable.

Replacement of obsolete with modern tools will emphasize several distinct trends in design. Perhaps the most outstanding is the more complete adoption of built-in electrical control systems, simplifying and co-ordinating the machine's functions.

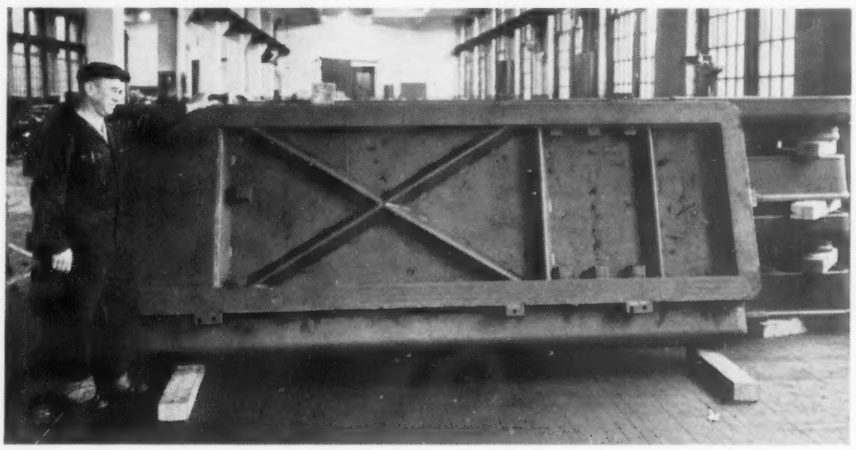
Another trend is the increasing use of rolled steel—flame cut and welded—and steel forgings, in place of castings. Proponents of the use of welded steel construction contend it gives a new freedom of design, greater rigidity, eliminates unnecessary weight. Especially in machine bases and bed plates is rolled steel proving advantageous.

Steel versus cast iron construction, however, continues a controversial matter. Some machine tool builders have hesitated to adopt welded steel for fear of meeting sales resistance by customers accustomed to cast iron construction; others who are using steel construction are not stressing the point. Still other builders have their own foundries which makes it inexpedient to change from the conventional construction.

Where castings are continued, they are often improved by alloying with more nickel, and in some instances using cast steel in place of cast iron.

More attention is being paid to the appearance of the tools. Smooth surfaces and simplified lines are in harmony with the general trend toward streamlining.

Individual tool builders constantly are adding improvements in safety features, performance and appearance of their product. One recent innovation is the light beam control. A number of large presses equipped with special starting and stopping control features have received considerable attention.



■ **Welded rolled steel base section for an 8½-ton Warner & Swasey turret lathe incorporates legs, pan and tank into one trim unit. Rigidity two to three times as great as that of the conventional base with bolted on pan is obtained, using V-angles in the rim and in the X-frame and cross beams. Boom Boiler Co., Cleveland, fabricated the unit**

Reports Revisions for Transformer Standards

■ Resistance Welder Manufacturers' association reports considerable progress in revision of its standard transformer specifications. The matter of revising these specifications has been under advisement for some time and at a meeting of the association in Detroit, July 14, a special committee appointed by President W. A. Anderson, including the electrical engineers of several member companies, devoted nearly a day to a study of proposed changes.

The association adopted a number of recommendations presented by the committee through its chairman. A. D. Jardine, Welding Machines Mfg. Co., Detroit. As a result, the specifications for transformers are to be completely rewritten and submitted to the association for final approval at its next meeting Sept. 14.

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has booked an order from Consolidated Edison Co., New York, for 25,000 electric irons, to be manufactured at its plant at Mansfield, O.

Monopoly Investigation "Not for Purposes of Prosecution"

■ VIGOROUS denial is made by the antitrust division of the department of commerce that it would use the monopoly investigation as an instrument to obtain evidence for prosecution cases.

The justice department at Washington, in issuing a long statement on this subject, called attention to the fact that collection of evidence for particular prosecution is a detailed matter requiring examination of a large number of witnesses on matters which are not of general economic interest or importance.

Secondly, according to the department, as a practical matter, the monopoly investigation is not at all adapted for the purpose of preparing a case. The grand jury is a much more useful instrument, in view of the fact that testimony before a grand jury is not given in public. Therefore, witnesses are free to talk without fear of retaliation from those against whom they may be testifying.

Patent Situation First Target

It was further pointed out that the power of subpoena given to the national economic committee incorporates the provisions of the public utility holding company act, to the effect that no witness who asserts his privilege shall be prosecuted or subjected to any penalty or forfeiture on account of any transaction concerning which he is compelled to testify or produce documentary evidence before the committee. It can be seen, therefore, that the antitrust division would be barred from using any evidence disclosed in the course of the investigation in a subsequent criminal prosecution against the witness.

There was every evidence last week that the committee in taking up its work might start with the patent situation. This is a matter to which the administration has given considerable thought and the alleged patent monopoly was one of the subjects especially mentioned by the President in his message to congress when he urged such an investigation.

Last week the securities and exchange commission announced its plans in connection with the monopoly study by the commission and other branches of the government whose officials are members of the economic committee.

Assistant Secretary of Commerce Patterson, a member of the economic committee, is looking into the situation and it is understood he will have his plans ready for announcement soon.

While the matter has not yet been closed, it is reported Secretary Patterson has invited Dr. Willard Thorpe, Dun and Bradstreet economist, to head the department of commerce organization. Should he accept the assignment it is believed that it will be on a part time or advisory basis.

Congressional members of the committee are absent from Washington, but the work is well under way through efforts of officials who are in the capital.

Wire-Tying Machines in Federal Trade Complaint

■ Violation of section 3 of the Clayton act, which prohibits exclusive dealing agreements, is alleged by the federal trade commission in a complaint issued against the Gerrard Co. Inc., Chicago, engaged in the manufacture of wire-tying machines and in the sale of steel wire for use in the machines.

The complaint also names as respondent the American Steel & Wire Co., which allegedly owns the Gerrard company.

The Gerrard company is said to lease and license machines on condition that lessees or licensees will not use in its machines tying wire sold by competitors.

John Stevenson Dies; Pioneer in Steel Industry

■ John Stevenson Jr., pioneer steelman and prominent in early steel consolidations, died at his summer home in Beaumaris, Ont., July 20. He was 90.

A native of Glasgow, Scotland, he came to the United States when 22 at the behest of Andrew Carnegie, and was assistant engineer on the construction of the Carnegie Steel Works, Pittsburgh. He left the Carnegie company to become manager of the New Castle Wire Nail Co., and in that capacity arranged the merger of the firm with the rod mill of the New Castle Steel Co. This was reported as "the first merger in the American steel industry."

Among companies which Mr. Stevenson later helped to organize were the Sharon Steel Co., Union Steel Co. and New Castle Steel & Tin Plate Co.

At one time he was associated with the Mackintosh-Hemphill Co. He left that company to go to the Edgar Thomson steelworks, where in 1876 he was a co-worker with Captain "Billy" Jones. Later he returned to Mackintosh-Hemphill as a partner. In 1883 he moved to New Castle, Pa., and for two years was identified with J. P. Witherow & Co., now the Pennsylvania Engineering Works, leaving that firm to build the New Castle Nail Works.

In turn, he was interested in a wire mill, rod mill, steel plant, tube mill, tin plate plant, and blast furnaces. His holdings in these were disposed of in various consolidations. Soon after the Sharon Steel Co. was organized by F. H. Buhl and others, he acquired a large interest and became general manager of the company. At that time he also was president of the Sharon Tin Plate Co.

Mr. Stevenson's body was to be taken to Pittsburgh July 23 for burial in Allegheny cemetery.

MEETINGS

DISTRIBUTION IS TOPIC FOR BOSTON CONFERENCE

■ TENTH Boston Conference on Distribution will be conducted in Hotel Statler, Boston, Sept. 26-27, under sponsorship of the retail trade board, Boston chamber of commerce, and co-operation of Harvard university graduate school of business administration, Boston university college of business administration, Massachusetts Institute of Technology, and others.

This meeting constitutes a national forum on distribution problems, and a portion of the program will be devoted to world aspects of the subject. Leading European business executives, in America for the Seventh International Management congress, will address the conference. Daniel Bloomfield, 80 Federal street, Boston, is director.

WASTE MATERIAL DEALERS PLAN WESTERN CONVENTION

National Association of Waste Material Dealers Inc., through its president, Joseph Shapiro, announces a fall convention in San Francisco, Oct. 17-19. This is said to be the first time a national convention of the waste material trade has been held west of Chicago.

A special party from the East will attend. Information can be obtained by addressing the secretary, Charles M. Haskins, 1109 Times building, New York, or the convention committee, 16 California street, San Francisco.

FINANCIAL

■ CONTINENTAL Steel Corp., Kokomo, Ind., reports for second quarter net profit of $156,091, after all charges except undistributed profits tax. This is equivalent to 57 cents a common share, and compares with a net of $55,208 or 6 cents a share in the preceding quarter, and with $255,175 or $1.05 a share in the second quarter last year.

* * *

Otis Steel Co., Cleveland, shows a net loss of $520,101 in the second quarter, after all charges. A net loss of $297,378 was reported for first quarter.

* * *

Interlake Iron Corp., Chicago, has a second quarter net loss of $294,587, compared with a net profit of $572,834, or 28 cents a share, in the same period last year. A net loss of $266,321 is indicated for the first half this year, compared with a net profit of $945,037 in the first half a year ago.

* * *

Wickwire Spencer Steel Co., New York, reports its net loss for the June quarter was $117,922, against $331,916 in the first quarter. In the second quarter last year a net profit of $600,694 was earned. For the first six months this year net loss totaled $449,838.

* * *

Cliffs Corp., Cleveland, had a net profit of $129,874 in the first half, equal to 16 cents a share. In the same period last year its net profit was $367,966, or 45 cents a share.

* * *

A net loss of $192,006 is reported for the second quarter by Sharon Steel Corp., Sharon, Pa. For the first six months the indicated net loss amounts to $343,915, compared with a net profit of $1,148,036 in the first half last year.

* * *

For the twelve months ended June 30, Continental Can Co. Inc., New York, reports net income of $7,049,860, equal to $2.47 a share on 2,853,971 shares. In the preceding 12 months net income amounted to $9,274,932, equivalent to $3.25 a share. Directors have declared the third quarterly interim dividend of 50 cents a share on common, payable Aug. 15 to holders of record July 25.

Pickets Sentenced

■ Circuit Judge Ralph J. Dady in Chicago last week found ten pickets of the Chicago Hardware Foundry Co. guilty on contempt charges and sentenced them to county jail for 20 to 120 days. The judge described Robert Wirtz, 24, Northwestern university student, as "the leader of the strike, a man who had not worked at the plant but who had come into the picket line in defiance of law and order". Wirtz was sentenced to 120 days.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended July 23	Change	Same week 1937	Same week 1936
Pittsburgh ...	27	+ 2	83	67
Chicago	34	+1.5	84	70
Eastern Pa...	28	+0.5	70	50.5
Youngstown .	35	+ 5	78	78
Wheeling	51	+ 6	92	89
Cleveland	26	None	51	85
Buffalo	35	None	88	84
Birmingham .	50	+ 8	96	58
New England.	40	+ 5	90	78
Cincinnati ...	50	+12	93	76
St. Louis	18	None	93	†
Detroit	29	None	95	100
Average	36	+ 4	81	70.5

†Not reported.

Estimated Third Quarter Carloadings Off 19.6%

■ Third quarter freight car requirements for 29 principal commodities will be 19.6 per cent less than third quarter 1937 requirements, estimate the regional shippers' advisory boards. Estimated requirements for all commodities are 5,155,115 cars, compared with 6,413,014 in the third quarter of 1937.

Iron and steel requirements will be 269,318 cars, compared with 456,257 in the corresponding period last year, a decrease of 41 per cent. Ore and concentrates are expected to require 492,003 cars, compared with 822,294 in the third quarter of 1937, a decrease of 40.2 per cent. Coal and coke needs will decline 21.4 per cent from 1,705,080 to 1,340,240 cars, according to the forecast.

Pittsburgh River Steel Shipments Off in June

■ Although total shipments over the three rivers in the Pittsburgh district increased about 20,000 tons in June over May, the iron and steel tonnage decreased about 17,000 tons.

According to the United States engineers, Pittsburgh, iron and steel products shipped on the Allegheny in June amounted to only 45 tons, compared with 488 in May, and 15,000 in June, 1937. Ohio river shipments dropped to 58,350 tons in June from 75,750 tons in May. In June, 1937, they amounted to 147,100 tons. On the Monongahela, however, the tonnage increased from 38,450 in May to 39,270 in June.

PRODUCTION

■ INCREASED activity at most steel centers resulted in the national operating rate rising 4 points last week to 36 per cent, equal to the best rate this year, which was reached the first week in April.

Youngstown, O.—Advanced 5 points to 35 per cent, the rate also scheduled for this week. Eight blast furnaces, 33 open hearths and two bessemers were active. This week eight blast furnaces, 31 open hearths and three bessemers will be on. Business shows a steady increase.

Chicago — Increased 1.5 points to 34 per cent, highest since November.

Cincinnati — Rose 12 points to 50 per cent, and probably will hold this rate this week.

Buffalo — Unchanged at 35 per cent, indications pointing to further upward movement this week or next.

St. Louis — Continued at 18 per cent for the second week. At least three open hearths are scheduled to be lighted early in August.

Birmingham, Ala. — Addition of one open hearth brought an increase of 8 points to 50 per cent.

Detroit — Steady at 29 per cent, which is likely to hold until the Ford plant resumes steelmaking Aug. 8, when two or three open hearths will be lighted.

Pittsburgh — Schedules were increased during the week, to an average of 27 per cent, a gain of 2 points over the preceding week. At the close of the week production was at about 30 per cent.

Wheeling — One producer added to output, bringing the rate up 5 points to 51 per cent.

New England—Up 5 points to 40 per cent.

Central eastern seaboard — Production rose ½-point to 28 per cent. Several companies still are producing at May and June levels but one or two are busier.

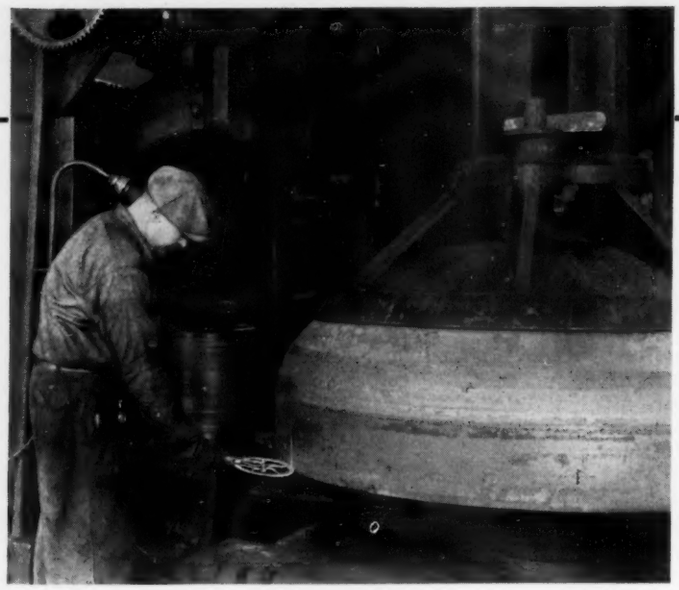
Cleveland — Unchanged at 26 per cent. The rate will be lower this week, National Tube plant at Lorain, O., being shut down for vacation.

■ Verity parkway, named for George M. Verity, chairman and founder, American Rolling Mill Co., will be dedicated July 29 at Middletown, O. Mr. Verity will press the switch which turns on the lighting system.

Industrial, civic and fraternal organizations will participate in a parade over the parkway, built on the site of the abandoned Miami and Erie canal.

WORTH

FLANGED AND DISHED HEADS



Measuring WORTH FLANGED AND DISHED HEAD for circumference with a hand measuring wheel.

Below: Testing the outside diameter of a WORTH head.

ALWAYS ACCURATE TO SPECIFICATIONS

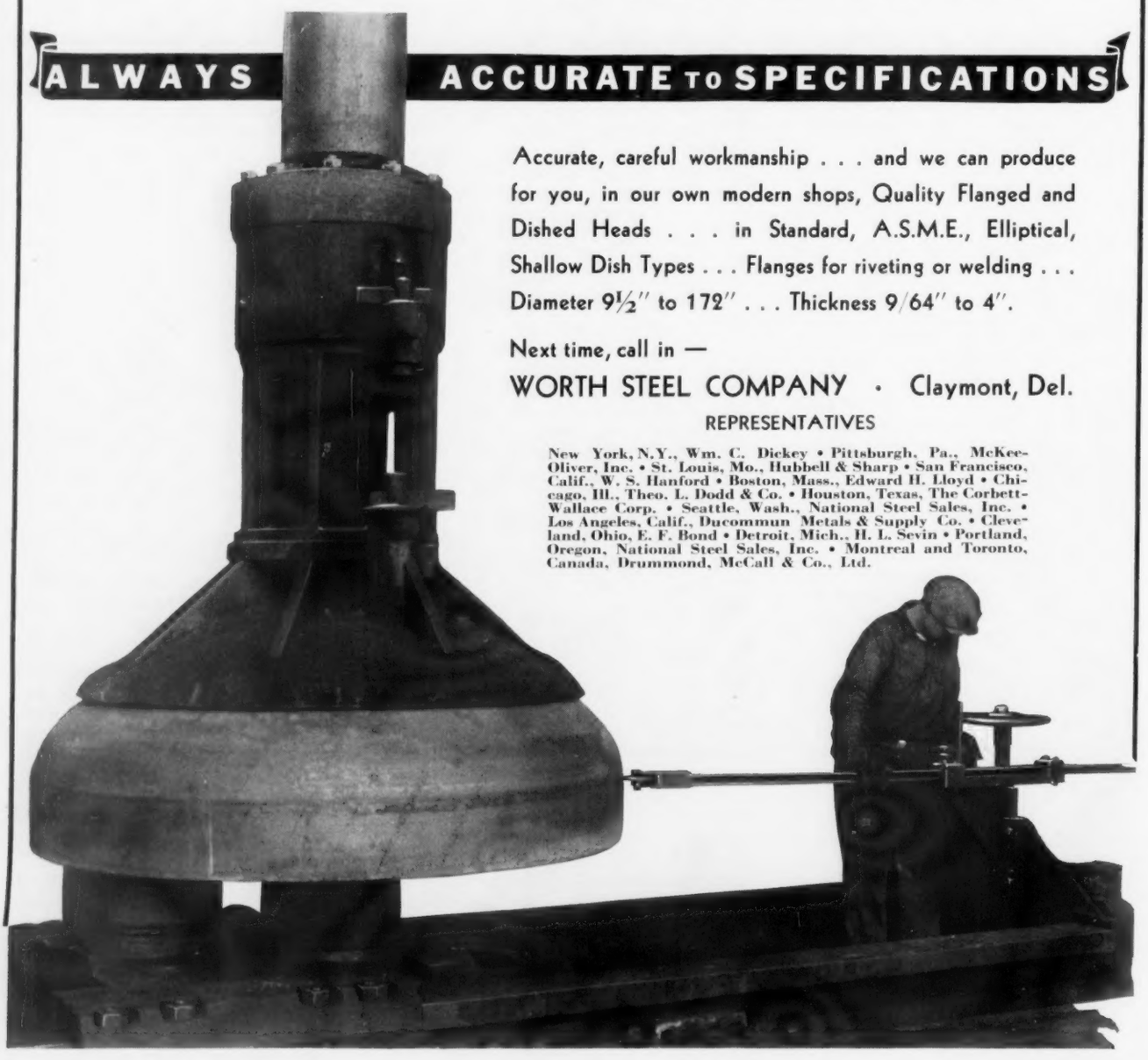
Accurate, careful workmanship . . . and we can produce for you, in our own modern shops, Quality Flanged and Dished Heads . . . in Standard, A.S.M.E., Elliptical, Shallow Dish Types . . . Flanges for riveting or welding . . . Diameter 9½" to 172" . . . Thickness 9/64" to 4".

Next time, call in —

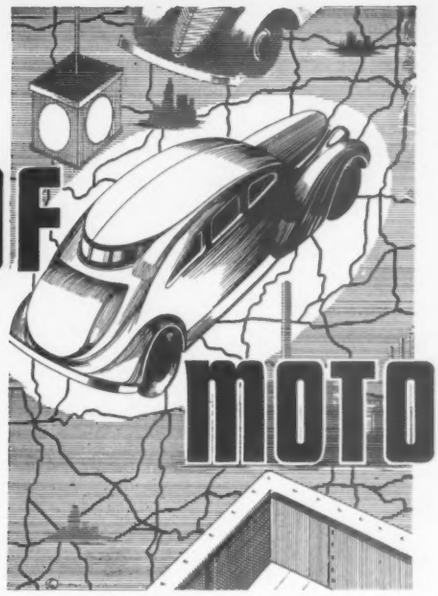
WORTH STEEL COMPANY · Claymont, Del.

REPRESENTATIVES

New York, N.Y., Wm. C. Dickey • Pittsburgh, Pa., McKee-Oliver, Inc. • St. Louis, Mo., Hubbell & Sharp • San Francisco, Calif., W. S. Hanford • Boston, Mass., Edward H. Lloyd • Chicago, Ill., Theo. L. Dodd & Co. • Houston, Texas, The Corbett-Wallace Corp. • Seattle, Wash., National Steel Sales, Inc. • Los Angeles, Calif., Ducommun Metals & Supply Co. • Cleveland, Ohio, E. F. Bond • Detroit, Mich., H. L. Sevin • Portland, Oregon, National Steel Sales, Inc. • Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.



MIRRORS OF MOTORDOM



DETROIT

■ "CATWALK cooling" is a term you probably will read frequently in descriptive announcements of 1939 models; and at this stage it appears the alliterative phrase is destined to take its place alongside other famous automotive terminology—"turret top," "free wheeling," "knee action," "floating power," and the like.

The new phrase has no connection with water cooling of engines, but is a descriptive term originated to apply to a relocation of radiator grilles and the inception of smaller auxiliary grilles in catwalks, the latter being that portion of the body metal between the fender and hood. In recent years, catwalks have been raised gradually as a means of improving front-end sleekness, and next year many will be still higher, approaching the level of the fender crown itself.

Some cars have appeared with louvers in these catwalks; the trend now appears to be toward the installation of bright metal grilles in catwalks together with cutting down the size of the radiator grille and lowering its position. A current example is the Lincoln Zephyr which next year will retain its present type of grille, but will be subjected to a little remodeling in the contour of the nose.

Will Be Adopted Widely

So popular has been the Lincoln Zephyr design that a universal trend toward that motif is in the making. In fact, a certain body designer, after looking over one of the 1939 designs, remarked that it looked more like a Zephyr than the Zephyr itself does.

Run down the list of makes—Nash, Studebaker, Hudson, Packard, Cadillac, Chevrolet, Chrysler, Buick and others—and "catwalk cooling" will be associated with practically all next year. Some will have three separate grilles, while others will blend the radiator grille right into the auxiliary or catwalk grilles. Many will relocate headlamps into front fenders further to clean up and streamline front ends.

Most of the grilles probably will be zinc die castings, although Chevrolet is understood to be working out an assembly of stamped steel strips chromium plated for the catwalk grilles.

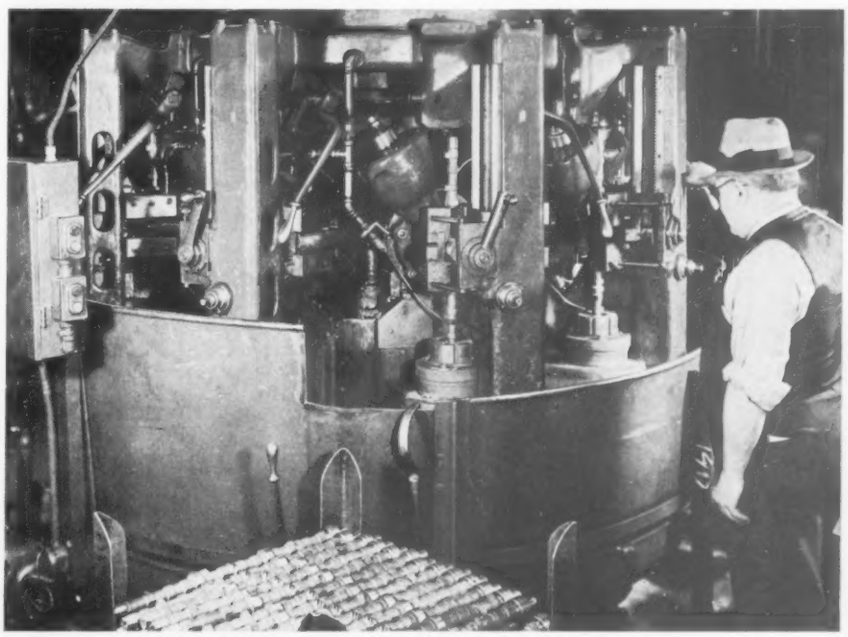
The Chrysler lines are leaning toward the front-end design of this year's Chrysler Royal, with the nose jutting forward even farther than on the Royal and grilles considerably lower and smaller.

While the term catwalk rolls off the tongue nicely, engineers say it is doubtful whether these auxiliary grilles provide any additional cooling to the motor compartment, especially since the radiator grille

BY A. H. ALLEN
Detroit Editor, STEEL

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

Insures Uniformity in Camshaft Gear Teeth



■ **Hobbing gear teeth on Plymouth camshafts is accomplished on this new eight-station machine, uniformity being insured by virtue of the fact each cutter spindle is pressed against the steel by the same master cam. Equipment was built by Cleveland Hobbing Machine Co., Cleveland**

itself is being cut in size. As air passes through the catwalk grilles, it must blow through a second opening or set of louvers in the under side of the fender to reach the engine, and it is estimated that 90 per cent of the cooling air still will have to come through the radiator grille. Nevertheless it is a good talking point and something for the advertising writers to toy with.

It also means some good business for the larger die casting companies such as Doehler, Alemite, etc., and for plants supplying dies.

Another style note which will gain wider acceptance next year is the so-called "fast back", also a feature of this year's Zephyr. The term is what designers use to identify the sharply sloping rear end which tests have shown to be an important adjunct to streamlining. Hudson, for one, will feature the "fast back" on next year's line.

While on the subject of automotive slangology, mention should be made of Buick's "bed spring suspension", a term which Buick's competitors cooked up as a derisive description of the coil spring system used by Buick on all four wheels. Undismayed, the Buick advertising experts adopted the term and proceeded to use it to advantage in subsequent promotion. Buick advertising, by the way, is generally conceded to be one of the highlights of the 1938 campaigns.

Olds Solves Problem

Following the many favorable reports on riding qualities achieved with coil springs on rear wheels, it was logical to expect some other builder to work out a similar design. Main drawback is the matter of maintaining rigidity; Buick was able to achieve the necessary stiffness through its torque-tube drive which other cars do not use. Without the extra strength provided by this drive arrangement, it is reported considerable chassis redesign work would be involved in changing over to rear coil springs.

But Oldsmobile apparently has licked the difficulty and unless there is a hitch in present plans will feature rear coil springs on the 1939 models. It is understood the problem of developing the required rigidity in axle and frame assembly was solved by the use of two radius rods extending from the central part of the frame to the ends of the rear axle. These provide the necessary longitudinal stiffening, while the use of a lateral stabilizer bar such as Buick now has gives the required sidewise reinforcement.

The merits of independent spring suspension apparently are outweighing whatever disadvantages the idea may have. It will be recalled this department recently made mention of the return to front coil springs by Dodge and Plymouth for next year; also that Chevrolet would adopt a new type of independent suspension with an open coil spring.

Some reports are heard of uneven tire wear caused by the action of independent suspension systems when cars are rounding turns. Such wear usually takes the form of a spot or series of spots around the outer edge of the tire tread. Service men usually recommend in such cases the diagonal transposition of tires; that is, right front to left rear, left front to right rear, etc.

■ NASH unofficially has reopened its small car development and has ordered a sample job constructed. Undoubtedly, however, it is too late to have the car in readiness for production this fall, so the logical deduction is that the introduction will be deferred until some time next year. But the project definitely has not been abandoned.

Willys has decided the small car market needs a shot in the arm and hence has made price reductions up to $26 on all of its line, applicable immediately on cars in dealers hands and on all future production at the Willys plant. Standard coupe model was cut $26; four-door deluxe sedan model $10.

Production at the Toledo, O., plant has been down this month, after 300 jobs were turned out in June, compared with 7154 in June a year ago. Output for the first five months of this year totaled 7850, compared with 42,474 in the same period a year ago, indicating about an 80 per cent decline. This inordinately high decline reflects as well as anything else the fact that the working classes of people are not buying automobiles this year, and is undoubtedly the reason why a number of small-car programs by other builders were dropped like hot potatoes.

■ AN AMUSING incident is related concerning one of the larger automobile company's efforts to do a little "consumer research" on a new model. Two proposed new models had been built up, one conservatively styled, the other distinctly radical. Eight men were selected at random throughout the company's plants and brought in to inspect the carefully guarded samples.

The first man was asked, "If you were buying a new car, which of these would you prefer?"

His blunt reply, "Right now I couldn't buy a bumper on either one of them."

A second man was asked the same question and he came up with the same reply.

The interrogator tried a different tack on a third man. "Assuming you had the money, which of these two cars do you think your wife would buy?"

The "consumer" pointed to the radically styled model and said his spouse would probably pick that one. When asked why, he replied, "Darned if I know, she's just that way, I guess."

This is just one example of the occasional futility of "customer research". In fact, some samplers of public opinion are inclined to the belief the public never knows what it wants, but has to be told.

■ AN INTERESTING type of machine has been developed here for the automatic inspection of small roller bearings for wheels. The rollers pass, one at a time, in front of an optical system where they are rotated one full revolution. The surface image is magnified and directed onto a bank of 60 photoelectric cells. A crack in the surface, even though not discernible by the naked eye, would be picked up by a certain number of photocells which through relays control a vane under the conveyor supporting the bearing. If the bearing is faulty the vane moves in one direction and the part falls into a reject bin; if O. K., the vane allows it to pass along for subsequent usage. The machine, not yet perfected in all details, operates at almost unbelievable speed, handling about one roller per second.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
April	527,625	553,231	238,133
May	480,518	540,377	210,183
5 mos.	2,125,140	2,395,716	1,116,663
June	469,368	521,153	*175,000
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Estimated by *Ward's Reports.*

Week ended	
June 25	40,918
July 2	40,945
July 9	25,375
July 16	42,010
July 23	32,070

	Week ended July 23	Week ended July 16
General Motors	13,415	17,900
Chrysler	2,750	6,190
Ford	12,500	12,500
All others	3,405	5,420

IN THE 1939 MANNER

If you had the job of designing a lawn mower—a quality mower—you would probably specify the same metal and production method used to turn out the ultra-modern machine shown here. If you were in any doubt, a careful investigation of *today's* materials and manufacturing processes would inevitably lead to the use of ZINC Alloy Die Castings.

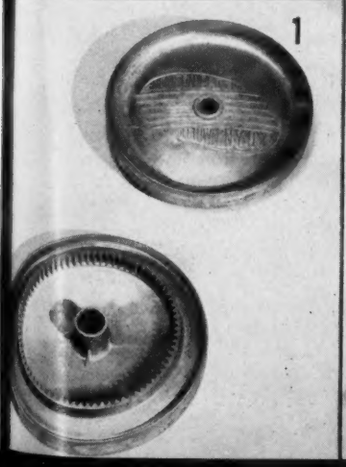
Twenty-five die castings, shown below, make up practically the entire mower. These ZINC Alloy parts not only provide impressive economies thru the elimination of machining and assembling operations—they insure efficient, dependable performance as well. Further, the finished appearance of the parts could not be matched at comparable cost with any production method. Typical of the flexibility of design with die castings are the parts in photograph 4. The steel cutting blades on the reel are cast as inserts in the supporting ZINC Alloy members, as is the steel tie tube in the two end sections.

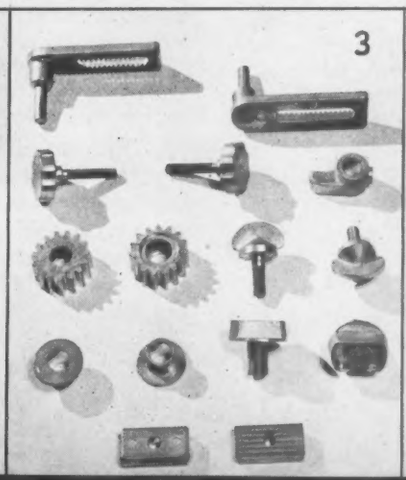
The physical and fabricating properties of ZINC Alloy Die Castings are such that they are ideally suited to a wide variety of products. Whether *your* production problems concern a husky industrial housing or a zipper element, we suggest that you consult a commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York City.

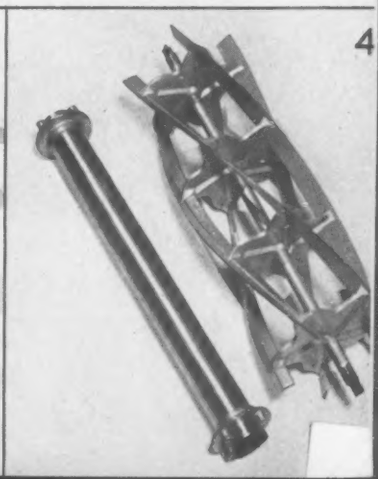
ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC







WINDOWS OF WASHINGTON

WASHINGTON

■ FOLLOWING a preliminary conference here last week between representatives of steel manufacturers, labor and the public contracts board, in connection with the setting of minimum wages in the iron and steel industry, L. Metcalfe Walling, administrator of the board, announced that in the formal hearing July 25 determination of minimum wages will be confined to primary products.

Last week's hearing was in executive session but Walling said that agreement had been reached not to make any effort at the formal hearing to set wage scales in the steel fabrication industries but these will be postponed until the facts have been established for primary production. He stated that wage rates, as such, were not discussed at last week's conference, but efforts were made to determine what job classifications will be included.

Walling explained that last week's conference was merely procedural and designed to pave the way for the July 25 hearing.

Hearings Start July 25

Those attending last week's conference included the following: John E. Laughlin Jr., National Steel Corp.; E. F. Blank, Jones & Laughlin Steel Corp.; Henry D. Scott, Wheeling Steel Corp.; R. M. Welch, Youngstown Sheet & Tube Co.; A. J. Gentholts and J. A. Voss, Republic Steel Corp.; L. S. Harding, Crucible Steel Co. of America; William Beye, United States Steel Corp. of Delaware; C. S. Bullard, Inland Steel Co.; C. A. McLane, Bethlehem Steel Co.; John P. Frey, metal trades department, A. F. of L.; Paul Scharrenberg, American Federation of Labor; Paul R. Hutchings, International Association of Machinists, A. F. of L.; Philip Murray, Steel Workers Organizing committee; Lee Pressman, Committee for Industrial Organization; Clinton Golden, Steel Workers Organizing committee; Harold Ruttenberg, Steel Workers Organizing committee; Frank Bennett, Amalgamated Association of Iron, Steel and Tin Workers of America; and Garrett A. Connors, Pittsburgh Steel Co.

BY L. M. LAMM

Washington Editor, STEEL

At the July 25 hearing, an opportunity to be heard, either in person or by duly appointed representatives, will be given to persons engaged in the iron and steel industry, either as employers or employes, and others, within the discretion of the board.

Briefs or telegraphic communications may be filed with the board. Employers appearing in person, or by representatives, or presenting briefs, should furnish the board with the following data: Name of firm; plant address; total number of employes in plant, whether male or female; classification of employes by occupations, including number engaged in each operation; hourly wages in each operation, with designation of applicable time period; if paid on piecework basis, weekly earnings in each class of employes and hours worked per week. This outline of suggested data by the board is not meant to exclude submission of any other pertinent information.

Employes appearing at the hearing are being asked to acquaint the board with facts as to the wages now being paid in the industry.

ANDREWS, NEW YORKER, TO HEAD WAGE-HOUR BOARD

Elmer F. Andrews, New York state industrial commissioner, has been appointed administrator of the wage-hour law by the President.

Mr. Andrews, a native of New York City, was appointed state industrial commissioner in 1933 for a two-year term and was twice reappointed. He had served as deputy commissioner since 1929 when Mr. Roosevelt was governor. He succeeded Miss Frances Perkins as state industrial commissioner.

In 1933 he served as labor advisor for the national labor relations board in the coal-mining region of Alabama, Kentucky and Pennsylvania. In 1934 President Roosevelt appointed him chairman of the American delegation of official observers at the Geneva International Labor Conference. The delegation's recommendations resulted in this country's joining the international labor office.

Mr. Andrews graduated from Rensselaer Polytechnic Institute in 1915 as a civil engineer and immediately went into the insurance business, during which he became familiar with practical compensation problems.

It is interesting to note in connection with the appointment of Mr. Andrews that his position in New York has been paying $12,000 a year and as administrator of the hours and wages law, he will receive $10,000. It is expected it will take Mr. Andrews several weeks to finish his work in New York state, but he will confer with labor department officials regarding his principal aids. The law does not become effective until Oct. 24.

WYSOR, WHITE TELL STAND OF REPUBLIC ON CIO

Hearings before the La Follette committee on civil liberties were reconvened here last week when Charles M. White, vice president of Republic Steel Corp., Cleveland, was one of the principal witnesses. It is expected these hearings will continue several weeks and their purpose, as outlined by committee of-

ficials, is to go into the steel strike situation of last year. Referring to the CIO as a kingdom set up by John L. Lewis, Mr. White told the committee that Republic Steel prefers to deal with the union in which employes are given choice of their officers.

"It always has been our policy," testified Mr. White, "that our employes should not have to pay someone for the privilege of talking to the boss. We do not expect to be blackjacked, or have our men blackjacked, into joining a union they do not want and that we prefer not to deal with."

"Prepared for Invasion"

It was stated that the four year period of harmony with its employes cost the Republic Steel more than $627,000. From June, 1933, to April, 1937, according to the testimony, $392,000 was spent by the corporation for the employe representation plan; $214,000 for fighting strikes and $21,000 for munitions and gas.

It was indicated that the strike cost item was not complete as submitted by the auditor of the company because it covered only four strikes and Senator La Follette put figures into the record from the bureau of labor statistics showing that the company had 13 strikes during the period covered.

During the course of his testimony, Mr. White stated the gas and munitions were purchased by his company because it was felt necessary to be prepared "to repel an invasion."

Mr. White told the committee, reading from a statement of labor policy, that "our first policy is one of fair dealing with the men." He stated the company would bargain collectively with representatives of any group of employes, and he said that first responsibility for employe relations is vested in departmental heads.

He read to the committee with special emphasis a provision that employes are to be free from coercion "from any source" and that employes not desiring to be represented by anyone need not be so represented.

R. J. Wysor, president of Republic Steel Corp., declared the investigation was presenting a distorted impression of the company's labor policies. He defended employe representation plans and said Republic would continue to deal with labor union representatives.

In a prepared statement read into the record Mr. Wysor said:

"When the country once realizes the great difference between collective bargaining for the mutual benefit of the employer and employe and collective bargaining for the purpose of regimenting employes and driving them into unions, it will wake up to the position in which we now find ourselves.

"The proof of my statement that real collective bargaining cannot be brought about alone by law is found in the unprecedented waves of strikes, sieges of plants and the breakdown of law enforcement that have come about under the reign of the Wagner Act and the national labor relations board.

"It is my opinion that one of the great needs of this day is for the adoption of amendments to the Wagner Act which will make it a fair law both to employe and employer. And when that is done the basis for industrial peace will be established."

"Collective Bargaining, Yes; Blackjacking, No!"

■ **CHARLES M. WHITE, vice president in charge of operations, Republic Steel Corp., was the first corporation witness to appear last week when the senate civil liberties committee in Washington resumed its hearings—hecklings, some called it—on the 1937 steel strike. He emphasized the point that his company believes in collective bargaining, but refused to have its employes "blackjacked" into joining any union. The great majority, he said, preferred not to belong to the CIO. Acme photo**

BETHLEHEM-SWOC CASE SIMPLIFIED BY AGREEMENT

Hearings in connection with the SWOC unfair labor charges against Bethlehem Steel Corp., before the national labor relations board, which began in September, have been closed. It has been announced by the board that by agreement no hearings in the representation phase of the case will be held until the board has made its decision in the complaint case.

Ending of the hearings in the complaint case was made possible by the parties stipulating the facts on the history and operation of the Bethlehem employes' representation plan in nine company plants. Since April, when the Bethlehem hearing was held at Johnstown, Pa., Hoyt A. Moore and Alfred McCormack, members of the firm of Cravath, deGersdorf, Swaine & Wood, Bethlehem counsel, and Earle K. Shawe, counsel for the board, have co-operated in drawing up the stipulations to the end that facts might be placed into the record by stipulation rather than through lengthy testimony of witnesses. It was estimated that this co-operation between the board and the company eliminated approximately 20,000 pages of testimony from the record.

STEEL JOIST MAKERS SEEK TO SIMPLIFY NAILER TYPE

A proposed simplified practice recommendation covering sizes of open web nailer type steel joists has been submitted to all interests for consideration and approval, according to an announcement of the division of simplified practice of the bureau of standards.

The joists are described as open web steel joists having a wood nailing strip securely attached to the top chord for the primary purpose of fastening a wood floor thereto. The proposal recommends six designations of joists in five depths, ranging from 8 to 16 inches, inclusive, and gives for each designation the allowable total load in pounds per linear foot of joist, resisting moment in inch pounds, and maximum end reaction in pounds.

June and First Half Exports Off

■ EXPORTS of steel and iron products, excluding scrap, from the United States in the first six months of 1938 totaled 1,117,366 gross tons, volued at $75,354,058, compared with 1,370,575 tons valued at $86,004,824 in the corresponding period of 1937, and 1,339,725 tons valued at $102,371,400 in first half of 1929.

June exports, excluding scrap, totaled 149,955 tons valued at $10,799,161, in comparison with 166,319 tons valued at $10,899,772 in May, and 306,897 tons valued at $17,916,848 in June, 1937.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	June 1938	May 1938	Jan. thru June '38
Pig iron	24,639	33,931	15,780
Ferromanganese and spiegeleisen	61	45	220
Other ferroalloys	105	28	655
Ingots, blooms, etc.:			
Not containing alloy	10,383	10,752	118,418
Alloy, incl. stainless	188	4,063	4,899
Steel bars, cold fin.	1,263	1,263	8,205
Bars, iron	159	18	858
Bars, concrete	1,158	890	8,267
Other steel bars:			
Not containing alloys	9,370	9,155	62,325
Stainless steel	13	26	211
Alloy, not stainless	219	543	2,242
Welding rods, elec.	100	56	535
Wire rods	3,392	2,098	16,967
Boiler plate	693	2,118	4,549
Other plates, not fab.:			
Not containing alloy	9,718	10,277	97,361
Stainless steel	2	18	134
Alloy, not stainless	129	466	1,892
Skelp iron or steel	429	683	6,618
Sheets, galv. iron	451	259	2,000
Sheets, galv. steel	6,622	6,595	33,431
Sheets, "black" steel:			
Not containing alloy	15,405	13,483	99,025
Stainless steel	141	88	1,190
Alloy, not stainless	358	141	2,289
Sheets, black iron	937	589	3,422
Strip steel, cold-rolled:			
Not containing alloy	2,858	1,912	13,274
Stainless steel	50	20	240
Alloy, not stainless	40	7	119
Strip steel, hot-rolled:			
Not containing alloy	2,089	2,138	16,822
Stainless steel	....	18	60
Alloy, not stainless	6	12	39
Tin plate, taggers' tin	12,840	9,078	89,227
Terne plate	346	233	2,557
Tanks, except lined	3,536	1,628	17,356
Shapes, not fabricated	7,428	12,670	49,288
Shapes, fabricated	2,769	1,442	19,426
Plates, fabricated	3,729	9,607	16,467
Metal lath	61	57	527
Frames and sashes	61	66	672
Sheet piling	116	374	1,869
Rails, 60 lbs.	774	1,188	32,059
Rails, under 60 lbs.	92	251	2,964
Rails, relaying	146	15	3,646
Rail fastenings	307	182	3,266
Switches, frogs, etc.	187	90	983
Railroad spikes	114	135	931
R. R. bolts, nuts, etc.	49	107	431
Boiler tubes, seamless	1,267	1,735	7,555
Boiler tubes, welded	28	1,180	1,301
Pipe:			
Smls. cas'g & oil-line	3,028	4,605	30,186
Smls. black ex. cas'g	655	639	3,616
Do welded	174	1,269	9,050
Pipe fittings:			
Mall. iron screwed	230	334	1,536
Castiron screwed	249	84	1,026
Pipe and fittings for:			
Cast-iron pressure	1,223	1,006	5,802
Cast-iron soil	946	756	4,892
Pipe welded:			
Black steel	736	992	5,136
Black wrought-iron	358	195	1,215
galvanized steel	1,095	856	5,850
galv. wrought-iron	136	188	1,256
Pipe and fittings:			
Riveted iron or steel	10	3	921
Wire:			
Plain iron or steel	2,093	1,567	10,467
Galvanized	2,362	2,193	10,661
Barbed	3,011	2,456	11,272
Woven wire fencing	289	161	951
Woven wire screen cloth:			
Insect	26	26	103
Other	86	194	590
Wire rope and cable	336	362	2,026
Wire strand	49	34	486
Card clothing	11	19	34
Other wire	489	494	2,833
Wire nails	1,547	1,788	8,067
Horseshoe nails	35	47	546
Tacks	11	17	102
Other nails, staples	424	445	1,795
Bolts, machine screws	604	739	4,136
Castings:			
Gray iron, semi-steel	293	297	1,719
Malleable iron	103	96	795
Steel, not alloy	137	237	724
Alloy, incl. stainless	153	58	436
Car wheels, tires axles	3,561	2,092	12,238
Horseshoes and calks	2	40	51
Forgings, n.e.s.:			
Not containing alloy	640	258	4,038
Alloy incl. stainless	25	42	237
Total	149,955	166,319	1,117,366
Scrap, iron and steel	160,577	371,745	1,785,372
Scrap, tin plate	775	909	6,043
Tin plate circles, strips, cobbles, etc.	224	427	2,788
Waste-waste tin plate	490	1,239	4,110
Total scrap	162,066	374,320	1,798,313
GRAND TOTAL	312,021	540,639	2,915,679
Iron ore	38,888	25,646	69,381

Britain Drives For Tin Plate

■ TIN plate producers in Great Britain are making efforts to regain their former position in world markets. As a result of construction of modern mills capable of reducing costs there is much uncertainty as to the future of the older plants.

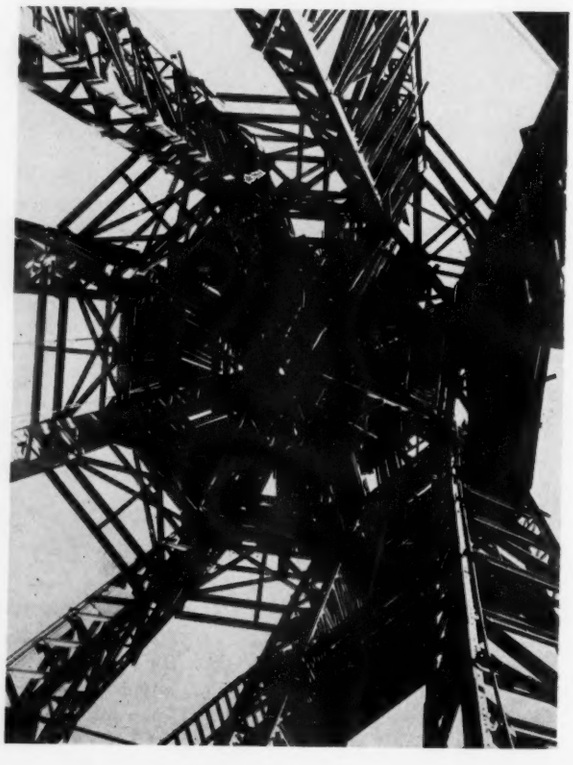
According to an analysis by the bureau of foreign and domestic commerce, Washington, in 1929 seventy per cent of the British output was shipped abroad. This included 20 per cent to empire countries and 50 per cent to others. The home market absorbed the remaining 30 per cent.

Since 1930 domestic consumption has gained steadily until in 1937 it accounted for more than 50 per cent of the output. At the same time shipments to empire markets have improved. In the first quarter of 1938 about 62 per cent of the export trade was accounted for by shipments to dominions.

At the same time a sharp decline has been registered in shipments to other countries. While world demand for tin plate has expanded since 1929 the British share fell from 28 per cent in 1929 to 24 per cent in 1937. Great Britain in 1929 exported 70 per cent of its produc-

Looks Like Steel Spider? It's Tower of the Sun

■ **Dominating architectural feature of the Golden Gate International exposition on Treasure Island, San Francisco bay, is this 400-foot Tower of the Sun. The spire cost $350,000, required 880 tons of steel, needs only plastering for completion. Footing for the structure, built on the new fill dredged from the bottom of the bay, is an 8-spoke wheel of reinforced concrete construction, 65 feet in diameter and 7 feet deep, and 224 ninety-foot piles**



tion, and this was reduced to 50 per cent in 1937.

Imposition of a tariff on steel imports in 1932 increased the cost of sheet bars, as cheaper Belgian steel had been used. Welsh tin plate bars were increased from £5 to £7 15s in 1937. This reduced the competitive position of Welsh makers. In the meantime, Germany, France and Italy have obtained a better footing.

The United States was the principal competitor of Welsh tin plate, but in 1928 an agreement was reached to maintain the ratio of the combined exports of the two countries at 70 per cent for the United Kingdom and 30 per cent for the United States. This agreement ended in 1931.

In June 1934 the international tin plate cartel was formed by producers in the United Kingdom, United States, Germany and France, with Italy becoming a member the following year. The original agreement gave France a fixed quota of 36,000 tons and the Saar 15,000 tons. Germany was given a quota of 16 per cent of total exports and the remainder was alloted to the United Kingdom and United States on the basis of 70 and 30 per cent, respectively.

New Mill Is Strong Factor

The principal factor in the British tin plate industry is Richard Thomas & Co. Ltd., which is about to start production in a new plant at Ebbw Vale. (STEEL, July 11, page 17). Within the past five years this firm has absorbed 17 competing organizations. There is said to be growing anxiety among producers in the Swansea, Wales, area. When a quota is allocated to the Ebbw Vale plant it is thought it may be as high as one-third of the present British production.

Sir William Firth, chairman of Richard Thomas & Co. Ltd., holds that small individual units do not possess sufficient financial resources to erect modern plants and compete in export markets. Further amalgamation is expected by many observers.

In 1937 the British tin plate industry operated at 80 per cent of capacity, producing 955,000 tons of tin plate, terne plate and black plate. In the 1930-37 period annual output averaged 785,000 tons, 65 per cent of capacity.

ARMCO MEN WILL START NEW EBBW VALE PLANT

Eight men from the East works blooming, bar and strip mill force of American Rolling Mill Co., Middletown, O., sailed July 20 from New York for Wales to assist in starting the new continuous strip mill of Richard Thomas & Co. Ltd., Ebbw Vale. In the party are Foster McGraw, Forest Barnes, Edgar Tipton, Tom Reynolds, James Neill, Robert Funston, John Fuller and Richard Getter. S. E. Graeff, formerly assistant general superintendent at East works, is assistant manager of the Ebbw Vale plant. The Middletown men will be in Wales several months. The Thomas company is an associate of Armco.

More Pig Iron in Steel, Less Scrap

■ STEEL and iron scrap consumed in the United States in 1937 totaled 38,006,272 gross tons, an increase of 5 per cent over 1936, while consumption of pig iron amounted to 34,056,527 tons, 13 per cent above the previous year, according to the bureau of mines.

In the manufacture of steel 28,851,263 tons of pig iron was consumed in 1937, compared with 25,619,270 tons in 1936, an increase of 13 per cent. Scrap charged into steel furnaces in 1937 totaled 28,367,938 tons, compared with 27,782,476 tons, an increase of 2 per cent.

Home scrap, that produced by the steelworks consuming it, increased more than purchased scrap and the net effect of greater use of pig iron and home scrap was to reduce the proportion of purchased scrap used in steel furnaces from 24.6 per cent of the total in 1936 to 23.4 per cent in 1937. Production of steel increased 6 per cent in 1937 over 1936 and this caused an increase in the tonnage of home scrap available.

The feature of the scrap market was the tremendous increase in exports, which reached the new high of 4,029,590 tons, 111 per cent over 1936. The larger domestic demand and heavy exports resulted in prices being high during the first three quarters. During last quarter the price descended sharply as steel production was curtailed.

Open-hearth furnaces in 1937 used 69 per cent of the total scrap melted in making steel, 26,414,037 tons, compared with 26,295,691 tons, 72 per cent of the total, in 1936. Bessemer converters used 239,356 tons in 1936 and 230,503 tons in 1937. Electric furnaces melted 1,247,429 tons in 1936 and 1,723,398 tons in 1937.

Export of 4,029,590 tons in 1937 compares with an average of 299,962 tons for the period 1925-1929, inclusive. The 1937 exports equaled 11 per cent of domestic consumption, compared with 5 per cent in 1936 and 1.5 per cent in 1929. Japan took 47 per cent of the exports in 1937, the United Kingdom 20 per cent and Italy 9 per cent.

Pennsylvania was the largest consumer of scrap in 1937, using 9,376,418 tons, 24.67 per cent of the total. Ohio was second with 7,589,332 tons, 19.97 per cent, Indiana third with 3,816,968 tons, 10.04 per cent, Illinois fourth with 3,725,455 tons, 9.80 per cent.

June Foundry Equipment Orders, Shipments Down

■ Foundry equipment orders dropped sharply in June, the net order index being 61.2, compared with 90.6 in May and 228.2 in June, 1937, according to the Foundry Equipment Manufacturers' association. Shipments also receded, the index for June being 78.5, compared with 91.3 in May and 232.1 in June of last year.

Unfilled orders index for June was 140.2, compared with 157.5 in May and 372.8 in June, 1937. Three months average of gross orders was 77.3 for June, 94.9 for May and 226.1 for June, 1937. Indexes are based on 1922-24 as 100 per cent.

Ferrous Scrap and Pig Iron Consumption

Gross Tons

	1936	1937	Per cent change 1937 over 1936
Consumption, home scrap	18,901,389	19,871,033	+ 5
Consumption, purchased scrap	17,456,744	18,135,239	+ 4
Total scrap consumed	36,358,133	38,006,272	+ 5
in iron furnaces[1]	8,575,657	9,638,334	+ 12
in steel furnaces[2]	27,782,476	28,367,938	+ 2
Pig iron consumed in steel furnaces	25,619,270	28,851,263	+ 13
Total ferrous materials charged to steel furnaces	53,401,746	57,219,201	+ 7
Home scrap % of total	27.4	26.2	.....
Purchased scrap do.	24.6	23.4	.....
Pig iron do.	48.0	50.4	.....
Exports of ferrous scrap	1,936,132	4,092,590	+111
Price of scrap[3]	$15.84	$18.96	+ 20
Price of pig iron[4]	$19.10	$22.99	+ 20

[1] Includes blast, cupola, air, puddling, and crucible furnaces. [2] Includes open-hearth, bessemer, and electric furnaces. [3] No. 1 heavy melting at Pittsburgh. [4] Basic pig iron f.o.b. valley furnaces.

MEN OF INDUSTRY

■ C. W. BRIGGS, physical metallurgist, naval research laboratory, Washington, will join the staff of the Steel Founders' Society of America, Cleveland, Oct. 1 as technical engineer. A graduate of Stanford university with a degree in metallurgy, he has devoted most of his time to research work for the United States navy, being at present the directing head of the steel casting research department. Mr. Briggs is well known for his many contributions to recent technical literature in the steel casting field, and in 1937 was the recipient of the William McFadden gold medal for outstanding research in cast steel.

Among the projects which Mr. Briggs will initiate in his new affiliation will be the development of a cast steel data book for the use of engineers, designers, and engineering students.

C. W. Briggs

♦

E. A. Rutledge, heretofore manager of the Wheeling Corrugating Co. plant at Martins Ferry, O., has been named assistant to the general manager of the Benwood plant of Wheeling Steel Corp.

♦

Edwin C. Barringer, editor, *Daily Metal Trade,* Cleveland, has been appointed executive secretary, Institute of Scrap Iron and Steel Inc., to succeed Benjamin Schwartz, who recently asked to be released from his contract. Mr. Barringer will take office Aug. 15, with headquarters in New York.

Practically all of Mr. Barringer's business career has been devoted to editorial work. During 1912-1917 he was political reporter for daily newspapers in Cleveland and Columbus. In 1917 he joined the Penton Publishing Co., Cleveland, publisher of STEEL and other business magazines. He was successively Washington and Chicago editor of its publications, managing editor of STEEL, and editor of *Daily Metal Trade*, since May, 1936.

♦

George L. Davis has been appointed vice president in charge of sales,

G. L. Davis

Diamond Power Specialty Corp., Detroit. Mr. Davis joined the Diamond organization in February, 1924, and after several years in the Chicago sales office, was transferred to Detroit as assistant sales manager, Prior to joining the corporation Mr. Davis worked four years in both operating and sales departments, Oliver Iron & Steel Corp., Pittsburgh, and for two years in the sales department, Calorizing Co., Pittsburgh.

♦

Ralph Nolan has been appointed representative of the furnace division of Continental Roll & Steel Foundry Co., Coraopolis, Pa., to handle sales and engineering of industrial combustion equipment and allied furnace accessories. He will cover the southern district, with offices in the Citizens & Southern National Bank building, Atlanta, Ga.

♦

Walter Williamson, active in the electrical business since 1910 and recently manager of apparatus and supply sales, Westinghouse Supply Co., East Pittsburgh, Pa., has been elected vice president.

♦

Raymond Szymanowitz, formerly technical director, Acheson Colloids Corp., Port Huron, Mich., has been promoted to vice president and technical director of Acheson Industries Inc., technical development company for the Acheson interests. In his new capacity Mr. Szymanowitz will continue supervision of all research activity of Acheson Colloids Corp.

♦

Charles M. Griffith, vice president in charge of trackwork sales, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has retired after more than 50 years of continuous service. Although no longer actively engaged at Taylor-Wharton, Mr. Griffith will, however, be available in a consulting and advisory capacity. His former duties will be assumed by J. A. Krugler, general sales manager.

♦

William C. Simpson, associated with the Lukens Steel Co., Coatesville, Pa., since January, 1934, serving successively as research engineer, research metallurgist and since September, 1936, in the sales and sales development department, has been promoted to manager of sales of the newly established sales office in Pittsburgh. A graduate of Lehigh university, 1932, with a degree of bachelor of science in metallurgical engineering, Mr. Simpson formerly was associated with Beth-

E. C. Barringer

W. C. Simpson

lehem Steel Co. at Sparrows Point, Md.

♦

Norman R. Downie, formerly engaged in the sale of wire rope in the New York sales district, Bethlehem Steel Co., has been transferred to the home office at Bethlehem, Pa., and will assist C. M. Ballard, manager of wire rope sales. Mr. Downie was associated with the former Williamsport Wire Rope Co. as eastern manager from 1925 until its acquisition by Bethlehem last year.

DIED:

■BERT A. MICK, who, prior to becoming sales manager of the steel plant division of National Alloy Steel Co., a subsidiary of Blaw Knox Co., Pittsburgh, in 1930, was engineer of the roll and mill departments of Mesta Machine Co. for 15 years, and later manager for ten years of roll sales for the Hubbard Steel Foundry Co., in Pittsburgh, July 17.

♦

George J. Black, 42, general purchasing agent, Standard Sanitary Mfg. Co., Pittsburgh, in that city, July 18.

♦

David M. Averill, 59, general manager of Racine and Kenosha, Wis., plants of Nash-Kelvinator Corp. until his retirement a year ago, at his home in Kenosha, July 17.

♦

Charles Major, 82, former manager of Pencoyd rolling mills and foundries of American Bridge Co., Pencoyd, Pa., at his home in Norristown, Pa., July 14. Mr. Major began service at Pencoyd in October, 1879, retiring April 1, 1921.

♦

Everett Gibbs, 64, resident manager, Continental Can Co., Baltimore, in that city, July 15. Mr. Gibbs went to Baltimore 40 years ago, founding the Southern Can Co., which became merged with Continental nine years ago.

♦

R. B. Hurlburt, 51, assistant export manager, Pratt & Whitney Co., Hartford, Conn., at his home in New Rochelle, N. Y., July 17. From 1929 to 1936 Mr. Hurlburt lived in London, Paris and Brussels as foreign representative of Pratt & Whitney.

♦

H. R. Atwater, 72, vice president, Osborn Mfg. Co., Cleveland, at his home in Los Angeles, July 16. He had been associated with that company 45 years. Mr. Atwater went to California in 1922 where he represented the Osborn company and also the W. W. Sly Mfg. Co., Cleveland.

Activities of Steel Users, Makers

■G. S. ROGERS & CO., 228 North LaSalle street, Chicago, has been formed to assume and extend the activities of G. S. Rogers' Associates, manufacturer and distributor of processing materials for metalworking industries. Added functions include technical supervision of manufacture at five plants where products are made to specifications of the company. These include new liquid and solid carburizers, heat treating and drawing salts, quenching oils, core oils, cutting oils, drawing compounds and metal cleaners. George S. Rogers is president.

♦

Production has been increased 17 per cent on a new line of vibroplane and angleplane screens by Ajax Flexible Coupling Co., Westfield, N. Y.

♦

Pawtucket Mfg. Co., Pawtucket, R. I., is now carrying a full line of standard sizes of Herculoy bolts and nuts in addition to its regular line of steel and brass bolts and nuts.

♦

Thermal Processes Inc., 405 East Oliver street, Baltimore, has been formed to manufacture and market a new line of mechanical and steam atomizing oil burners for industrial heating operations. E. B. Dunkak is president.

♦

Power Piping division of Blaw-Knox Co., manufacturer and erector of prefabricated piping for power plants, oil refineries and other industrial usages, has opened a southern sales office in the Candler building, Atlanta, Ga., with O'Earl Kearney in charge.

♦

General Time Service, 1507 West Vliet street, Milwaukee, has been organized to specialize in repairing and reconditioning time telling and recording equipment requiring the fabrication of obsolete parts, wheels, pinions and gears, and to repair modern time instruments used in industrial applications.

♦

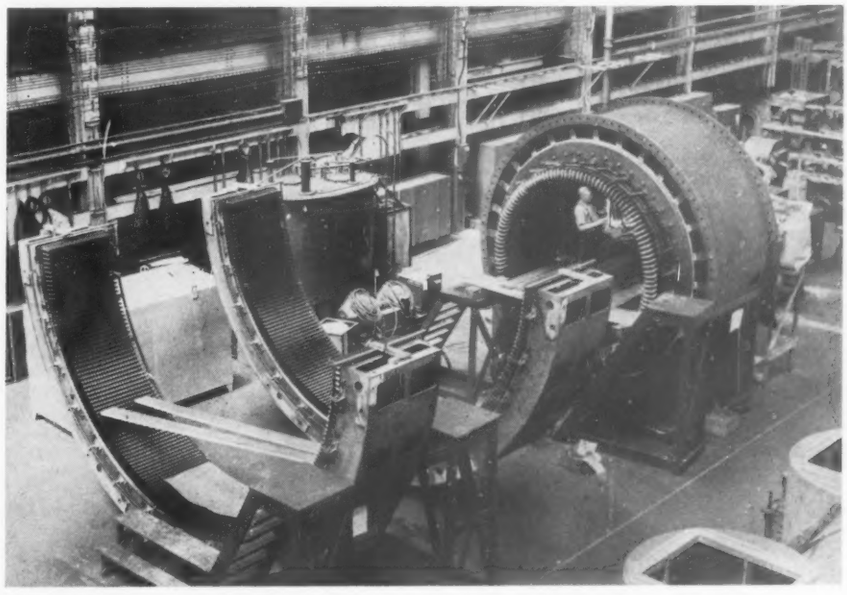
United States Smelting Refining & Mining Co., New York, producer of silver and lead, has entered the field of zinc. Heretofore the zinc concentrates, mined at the company's Bingham properties near Salt Lake City, were sold to the Anaconda Copper Mining Co., but under a new arrangement, these will be refined by Anaconda for account of the United States Smelting Co., which will sell the resultant zinc directly to the trade.

♦

Edgar E. Brosius Inc., Sharpsburg, Pa., manufacturer of blast furnace equipment, recently received an order for 18 60-inch goggle

(*Continued on Page 82*)

Power on the Half-Shell



■ **These two giant semicircles of steel and copper, in the forefront, comprise the stator for a waterwheel generator being built at Westinghouse Electric & Mfg. Co's East Pittsburgh works. In the background, a craftsman is adjusting the "throw" in the stator of a 60,000 kilovolt-ampere synchronous condenser**

Steel Figures In World Flight

■ THE RECENT globe-circling flight of Howard Hughes, in which nearly 15,000 miles were covered in 91 hours, 17 minutes total elapsed time, and 71 hours, 14 minutes actual flying time, averaging 208 miles per hour, ranks as a great achievement even in this era of aviation miracles.

For this victory over time, space, and the forces of nature, credit is due to the skill of the pilot and crew, and also to the engineering and metallurgical ability which can produce aircraft of such demonstrated stamina and dependability.

Except for additional fuel tanks and special radio equipment, the plane is a standard Lockheed "14" monoplane, similar to those used in regular transport service on commercial air lines in Canada and the Far East. It is powered by two Wright Cyclone motors, each developing 1100 horsepower.

In these motors the Wright Aeronautical Corp. specifies nickel alloy steels for practically every highly stressed part. Such members as the crankshaft, connecting rods and most of the gears are forged from nickel and nickel-chromium steels, carefully heat-treated to provide a combination of high strength with toughness.

All stressed bolts, studs and nuts are of nickel steel, not only in the engines but throughout the body of the plane. In the Hamilton Standard constant speed propellers the hubs and spiders are forged from nickel-chromium-molybdenum steel, to assure high strength and fatigue resistance.

* * *

Forty Timken bearings are used in Hughes' plane. Each of the motors is equipped with 18 of the bearings, two on each rocker arm. Timken bearings also are used in the Goodyear landing wheels of the plane.

Timken aircraft quality electric furnace steels are used in many important parts in the Wright engines, such as the crank case, crank shaft, cylinders, master connecting rods, articulated connecting rods, piston pins and propeller parts.

■ Aluminum Corp. of India Ltd. will build an aluminum works in Bihar province, India, with annual capacity of 8000 tons. Skoda-Werke, Czechoslovakia, which is supplying machinery, will have a financial interest.

Steel Blades To Carry Gray Wings Over the Clouds

■ **Glistening, alloy steel propeller blades, lined up at Transcontinental & Western Air, Inc., maintenance base, Kansas City, Mo., for inspection, before being installed on passenger planes. Steel airplane propellers are hollow, and several methods are used in fabricating them. This group—25 are counted in the photograph—is reported to be part of one of the largest shipments of such blades ever made to a commercial airline. Wide World photo**

Steel's Accident Rate Up Slightly

■ ACCIDENTS in the steel industry increased 4 per cent in frequency and 5 per cent in severity in 1937 over 1936, according to the National Safety council, Chicago. Expanding production and employment of new and inexperienced workers generally tend to increase the accident rate.

Since 1926 steel companies have reduced accident frequency 61 per cent and severity 18 per cent. In 1937 injury rates were 8.51 for frequency (number of disabling injuries per 1,000,000 man hours of exposure) and 2.07 for severity (number of days lost as result of disabling injuries per 1000 man hours of exposure).

Corresponding averages for all industries were 13.35 and 1.58.

Survey Covers 141 Plants

Large steel plants had the lowest 1937 frequency rates, averaging 7.49, and small organizations had the best records in severity, averaging 1.51. Only small plants reduced both injury rates from 1936 to 1937.

The council's survey is based on reports from 141 steel plants whose employes worked 860,050,000 man hours during 1937.

Best known all-time no-injury record in the industry is held by Republic Steel Corp.'s Corrigan, McKinney works in Cleveland, with 5,325,144 man hours.

Honor roll for outstanding safety achievements during 1937 as listed by the council:

Large Units

Republic Steel Corp. Central Alloy Steel Co., Canton, O., had the lowest frequency rate—1.62.

United States Steel Corp. The Vandergrift, Pa., plant of Carnegie-Illinois Steel Corp. had the lowest severity rate—0.26.

Wheeling Steel Corp.'s Portsmouth works made the largest reduction in both injury rates since 1935—33 per cent for frequency and 48 per cent for severity.

Middle-size Units

United States Steel Corp. Worcester, Mass., plant of American Steel & Wire Co. had lowest frequency rate—1.17.

Republic Steel Corp. Newton Steel Co., Monroe, Mich., had lowest severity rate—0.08.

Otis Steel Co.'s Lakeside Avenue plant, Cleveland, made the largest reductions in both injury rates since 1935—26 per cent for frequency and 98 per cent for severity.

Small Units

Union Carbide Co. The Haynes Stellite Co., Kokomo, Ind., worked more hours without a disabling injury than any other small unit with a perfect record—627,000.

Republic Steel Corp. The Moline, Ill., plant achieved a perfect 1937 record and thereby reduced both injury rates 100 per cent since 1935.

Let's Have Real Facts on Monopoly!

■ FOR six years the country has heard about money-changers, thousand-dollar-a-day executives, monopoly and greed.

It has heard that industry fails to provide regular employment for those willing and able to work.

Also, that industry charges high prices for its products and underpays its workers, with the lion's share of the profits going into the pockets of 60 American families.

Now in process of organization is the long-heralded anti-monopoly investigation. The national economics commission, recently appointed by President Roosevelt, is the crucible in which business is to be refined.

It seems to be true, as held in many quarters in the metal producing and metal-working industries, that most of the members of the commission are better equipped theoretically than practically for their task.

The Commission's Conclusions Should Have Vast Future Effects

No member of the commission has a record of conspicuous success in business. None ever has had to meet a payroll.

But these are facts that industry will do well to overlook. The only fact that counts is that the conclusions reached by the commission will have a vital influence on future legislation affecting business.

Business men who are anxious over existing and threatened legislative and administrative curbs to business will do well to regard the commission's study as an opportunity.

They will do well to follow a course of active and complete co-operation, taking the initiative by formulating and presenting to the commission their views as to what is needed to insure prosperity for all classes of our citizens by providing for that of industry.

That such co-operation will be welcomed is indicated by the commission's disposition, already revealed, to take counsel with industrial leaders; also by the assurance of its chairman, Senator O'Mahoney, that the investigation will not be motivated by any desire to badger industry or overthrow the present industrial system.

Who can say what sort of labor relations act might now be in effect had employers generally shown a greater disposition to heed public demand at the time the Wagner act was under consideration?

Co-operation by Business Men May Promote Sound Understanding

Who can say what sort of securities and exchange act now would be operative had leaders in the trading world taken the initiative in the formulation of a law designed to protect investors without serving as a brake on investments?

In the emotional psychology now prevalent, business men who have something to contribute to the coming study of industry probably will proceed most effectively if their recommendations are aimed at the promotion of employment and the welfare of their employes.

For unemployment and low income are at the root of close to 100 per cent of all of our ills of today. In them is found the cause of most of the nostrums which are serving as business depressants.

If business men are able to assist the new commission in reaching constructive conclusions which will pave the way for better business in the future they will have served the country well.

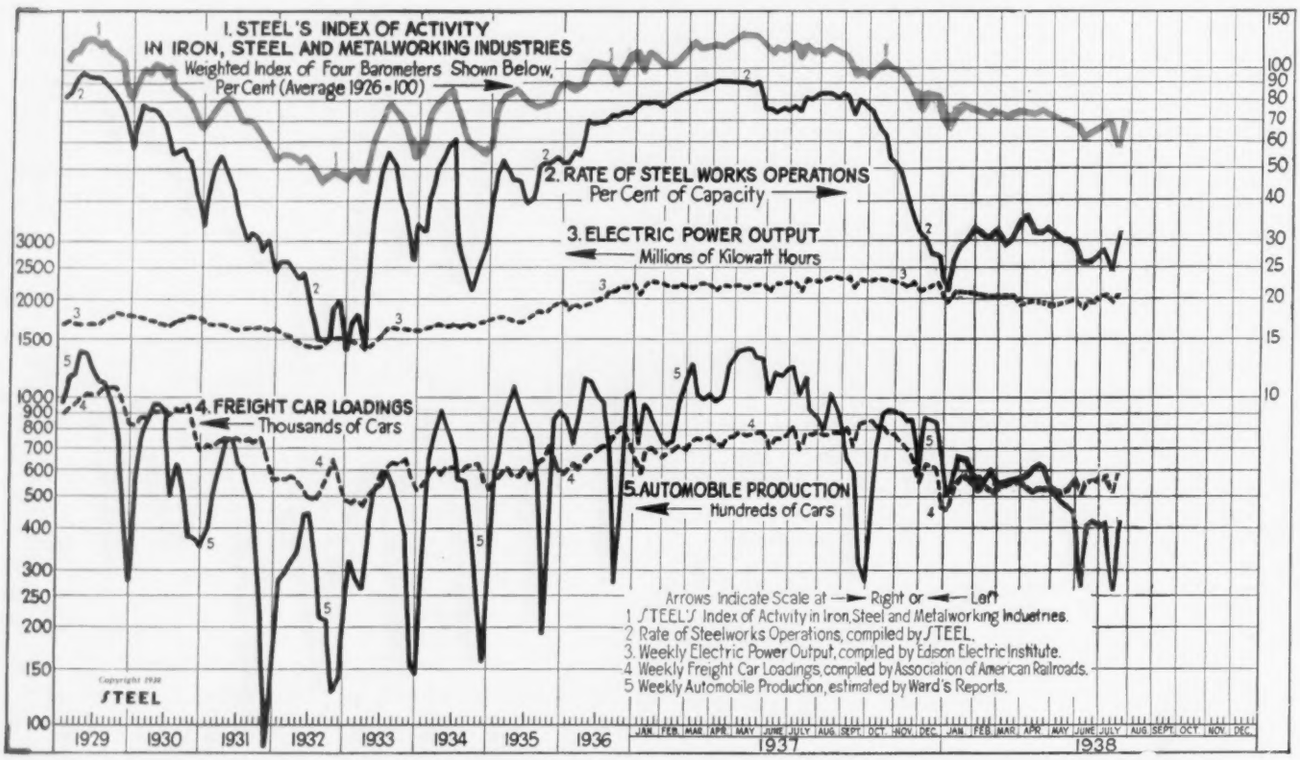
THE BUSINESS T

Index of Activity Registers Sharp Gain

■ THE rebound in industrial activity from the holiday lows has aided measurably in bolstering the confidence of many industrial leaders. Reflecting this gain in activity in the iron, steel and metalworking industries, STEEL's index recouped all the loss incurred during the Fourth of July week. It now stands at 69.7 per cent, compared with 57.1 in the preceding week and with 66.5 per cent in the week ended July 2. A year ago the index stood at 115.7.

Steelmaking operations during the week ended July 16 advanced to the highest level since the first of May. The steel rate of 32 per cent represents an increase of 8 points from the holiday low and is 4 points above the 28 per cent reported during the week ended July 2. Further gains to new high levels for this year are indicated in the current week.

After receding to the lowest level in many months during the week ended July 9, automobile assemblies registered a gain of 16,635 units to 42,010 in the week ended July 16. This is the highest weekly total since the week ended May 28 when automobile production was placed at 45,120 units. However, production of 42,010 cars in the week ended July 16 represents a decline of 61 per cent from the 115,380 cars assembled in the same week a year ago. Production estimates over the next few weeks indicate a slight decline for the week ended

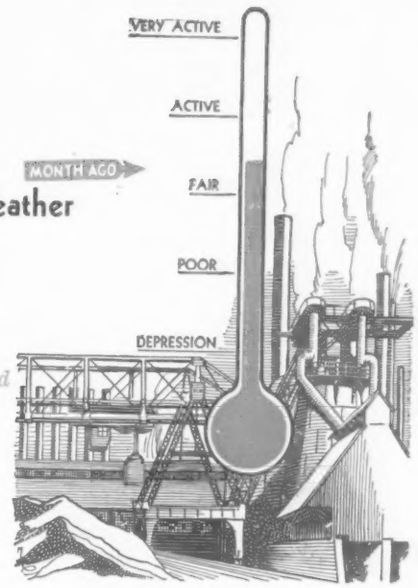

1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity gained 12.6 points to 69.7 per cent in the week ended July 16:

Week ending	STEEL'S Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767	761,182	60,563	133,164
Apr. 30	68.4	123.9	32.0	91.0	1,938	2,193	543,075	782,423	50,755	139,475
May 7	68.5	123.5	31.0	91.0	1,939	2,176	536,140	767,481	53,385	140,188
May 14	67.2	123.2	30.0	89.0	1,967	2,194	541,813	773,669	47,415	140,396
May 21	67.1	122.2	30.0	91.5	1,967	2,198	545,808	779,276	46,810	131,306
May 28	66.5	115.6	28.5	75.0	1,973	2,206	562,061	794,855	45,120	131,421
June 4	58.1	105.1	25.5	75.0	1,878	2,131	502,624	692,140	26,980	101,629
June 11	64.4	111.4	25.5	74.0	1,991	2,214	553,854	754,360	40,175	118,798
June 18	65.2	110.3	27.0	75.5	1,991	2,213	555,569	756,289	41,790	111,620
June 25	66.0	112.8	28.0	74.0	2,019	2,238	558,937	773,733	40,918	121,032
July 2	66.5	115.3	28.0	77.5	2,014	2,238	588,864	806,168	40,945	122,896
July 9	57.1†	103.8	24.0	74.0	1,881	2,096	501,013†	682,205	25,375	100,981
July 16	69.7*	115.7	32.0	82.0	2,089	2,298	591,195*	770,075	42,010	115,380

*Preliminary. †Revised.

S TREND



Industrial Weather

TREND: *Upward*

July 23 with sharper reductions scheduled in the following weeks. The bottom will probably be reached about mid-August.

Early estimates of revenue freight carloadings indicate an increase of approximately 90,000 cars to 591,195 for the week ended July 16. This represents the highest point touched by railroad car loadings this year. With a slight pick-up in general activity apparent, railroad freight traffic should continue to benefit accordingly.

Electric power consumption broke through the 2,000,000,000 kilowatt-hour level to reach the highest weekly output since the week ending Jan. 29. Power consumption for the week ended July 16 totaled 2,089,772,000 kilowatt-hours against 1,881,298,000 in the preceding week, a gain of approximately 11 per cent.

Signs that a tide of increasing cheerfulness is exerting a beneficial psychological influence upon business are multiplying, with the result that corrective factors are taking hold more positively to provide a momentum for recovery. Encouraging progress in liquidating inventories, price and cost readjustments, preliminary work on new auto models, large crops, advance in prices of basic wholesale commodities, backlog of deferred demands, direct spending and inflationary measures taken by the federal government all are exerting their corrective influences to turn the tide of industrial activity.

Where Business Stands

Monthly Averages, 1937 = 100

	June, 1938	May, 1938	June, 1937
Steel Ingot Output	39.5	45.2	100.8
Pig Iron Output	34.9	40.4	103.2
Freight Movement	76.0	74.9	102.5
Building Construction	...	92.9	124.1
Automobile Production	41.9*	50.3	124.7
Wholesale Prices	90.3*	90.4	101.0

*Preliminary.

The Barometer of Business

Industrial Indicators

	June, 1938	May, 1938	June, 1937
Pig iron output (daily average, tons)	35,186	40,675	103,843
Machine tool index	75.7	88.0	227.6
Finished steel shipments	478,057	465,081	1,268,550
Ingot output (daily average, tons)	63,010	72,272	160,914
Dodge building, awards in 37 states (sq. ft.)	...	34,760,000	46,393,100
Automobile output	*175,000	210,183	521,139
Coal output (tons)	22,850,000	21,266,000	31,776,000
Business failures; number.	1,018	1,053	670
Business failures: liabilities	$12,236,000	$14,559,000	$8,191,000
Cement production bbls.	...	10,361,000	11,163,000
Cotton consumption (bales)	...	426,000	681,000
Car loadings (weekly av.)	551,970	543,956	744,131

*Preliminary

Financial Indicators

	June, 1938	May, 1938	June,1937
25 Industrial stocks	$155.49	$143.10	$207.41
25 Rail stocks	$17.94	$16.97	$41.74
40 Bonds	$66.64	$67.99	$83.91
Bank clear'gs (000 omitted)	...	$20,169,000	$25,903,000
Commercial paper rate New York (per cent)	1	1	1
*Commercial loans (000 omitted)	$8,321,000	$8,334,000	$9,760,000
Federal Reserve ratio, (per cent)	82.5	82.4	79.5
Railroad earnings	†$16,496,701	$9,236,818	$43,662,959
Stock sales, New York stock exchange	24,364,130	14,007,564	16,443,293
Bond sales (par value)	$144,464,300	$121,323,925	$178,640,000

*Leading member banks Federal Reserve System.
†May, April and May, respectively.

Foreign Trade

	June, 1938	May, 1938	June, 1937
Exports	...	$257,177,000	$265,363,000
Imports	...	$148,260,000	$286,224,000
Gold exports	...	$212,000	$81,000
Gold imports	...	$52,987,000	$262,103,000

Commodity Prices

	June, 1938	May, 1938	June, 1937
Steel's composite average of 25 iron and steel prices	$38.41	$33.50	$39.82
U. S. Bureau of Labor index	*78.0	78.1	87.2
Wheat, cash (bushel)	$0.91	$0.93	$1.41
Corn, cash (bushel)	$0.71	$0.71	$1.36

*Preliminary

Geared Compensation

Proposes flexible pay plan founded on a minimum base rate with increases prorated according to business volume. Plan may aid job security and reduce industrial unrest

By G. T. TRUNDLE JR.
President
Trundle Engineering Co.
Cleveland

■ FOR YEARS rapid change has been a basic characteristic of American enterprise and in recent years the rate of change has been accelerated. We are aware of swift changes in prices, in public tastes and preferences, in methods or processes, in government regulation, in international policy. Yet with respect to methods of figuring compensation, this factor of rapid change still receives little attention.

Consider salaries. They are figured on the basis of so much a year. An amount once determined is supposed to be reasonably permanent. Result is when times are good management hesitates to raise salaries because it may build up a salary load which may carry over into poor times and prove too heavy for the company. Similarly, when times are poor and salaries should be reduced, management often delays this action so the company runs unnecessarily in the red and stockholders are penalized unduly.

Causes Insecurity

The same holds true with wages. Many a demand for a wage increase has been refused not because the company could not pay it at the time, but because the company hesitated to commit itself to a wage level which it might not be able to maintain. Conversely, employes' objection to lowering wage rates often is not because they are unwilling to suffer their share of a current depression but because they fear that once wage levels have been lowered they will remain on this reduced basis even after the next corner has been turned and business has started back uphill again.

As a result instead of making needed blanket wage reductions, companies allow existing rates to stand and try to effect the needed economies through layoffs. This in turn gives rise to a feeling of insecurity among workers, the basis of much unrest and discontent in this country.

The trouble is that while we are using methods to gage markets, adjust prices and produce goods we still use methods to calculate wages and salaries which were inherited from the days of infinitely greater economic stability than today. Perhaps "economic stability" is not the right expression. There was just as much change in the economic picture in this country in the old days as there has been in recent years, but the rate of change was slower.

Too Inflexible

I believe one of the great causes of present difficulties is that we have carried over to today's rapid tempo a salary and wage method altogether too inflexible, a method which makes it impossible to adjust properly current outgo to current income.

Consider the case of John Jones, department head. If his company does a volume of 100,000 units a month, it can afford to pay Jones at the rate of $3000 a year. But if the company sells 200,000 units a month, it could well afford to pay Jones at the rate of $4000 a year, and might be glad to do it. In actual practice the company starts the year at a rate of 100,000 units a month. Jones' salary is fixed at $3000 and remains so during the year, even though sales may rise by June to 200,000 units a month and

All-Metal Garage Door Tilts Up To Open

■ **Tilt-A-Door Corp., Highland Park, Ill., makes this all-metal door which tilts upward leaving no obstructing parts as a hazard to fenders. New door is lighter, stronger and more rigid than wooden type and eliminates warpage. Metal for doors is Paintgrip, product of American Rolling Mill Co., Middletown, O. Although galvanized, it permits immediate painting without special treatment**

by September may actually have reached 250,000 units. Conversely, if the company starts the year on a sales rate of 200,000 units a month, Jones may be given a salary of $4000 and may continue to get that rate throughout the year, even though a big wind hits the business by June and by November sales drop to as low as 75,000 units a month. In either case Jones' salary is wrong.

Why Not Proportional

Some system of compensation is necessary which will allow wages and salaries to vary in proportion to volume of business. Wages and salaries should be as flexible as other important factors of business.

Although the idea of variable salaries and wages may seem somewhat startling, in reality industrial workers of this country have had extremely variable incomes for years. Regardless of fairly uniform hourly rates of pay, the time worked during a year has varied widely. From the standpoint of monthly income, many employes have felt keenly the ups and down of business. Is there any good reason why salaried employes should not likewise feel these same current ups and downs?

All persons are after two things. They want a reasonable degree of security to protect them against misfortune and they want a reasonable degree of opportunity; that is, they want a chance to share in the good fortunes of the company with which they are connected.

Want Security

Rank and file of employes are interested primarily in security. They want the assurance of a continuing income. They want more money if more money is to be had, but this is not so vital as is the need for an assured year's income. Salaried men such as department heads have less to worry about from the standpoint of security, because they have more assurance of getting at least enough money for food, clothes and shelter. What they are vitally interested in is a chance to make more money as and when the company makes more money. And this is a chance which, under our fixed salary system, they seldom get.

Executives who constitute the company's management are not concerned with the bare necessities of a living. If the company continues to run at all, they will get along. What they want is a chance to take out of company earnings an amount commensurate with the management ability they have shown when and if earnings of the company are sufficient to justify this course. The stockholders want and expect a fair and consistent return on their investments.

I believe it is practical to work out a plan which will set up wages and salaries on a more flexible basis, and at the same time conform more closely to needs and desires of various employes and stockholders. The plan is this:

Presents Plan

First put as many of the regular employes as possible on a salary basis. The extent to which this may be feasible in any company depends upon nature of the business and many other factors.

Then, with as many people as possible on a salary basis, establish base salaries at a level which can be paid during poor times as well as good times.

After this, build up a schedule of additional compensation, on a basis proportionate to additional earnings, varying the rate of additional compensation in accordance with the position and needs of various classifications of employes.

For this purpose, employes should be divided into at least three classifications. Top executives should get the largest rate of increased compensation out of realized additional earnings. Junior officers or department heads, being less directly responsible for plans and policies which resulted in additional earnings, get a smaller rate of additional compensation. Other salaried employes, primarily interested in security, would be entitled to a smaller rate of additional compensation.

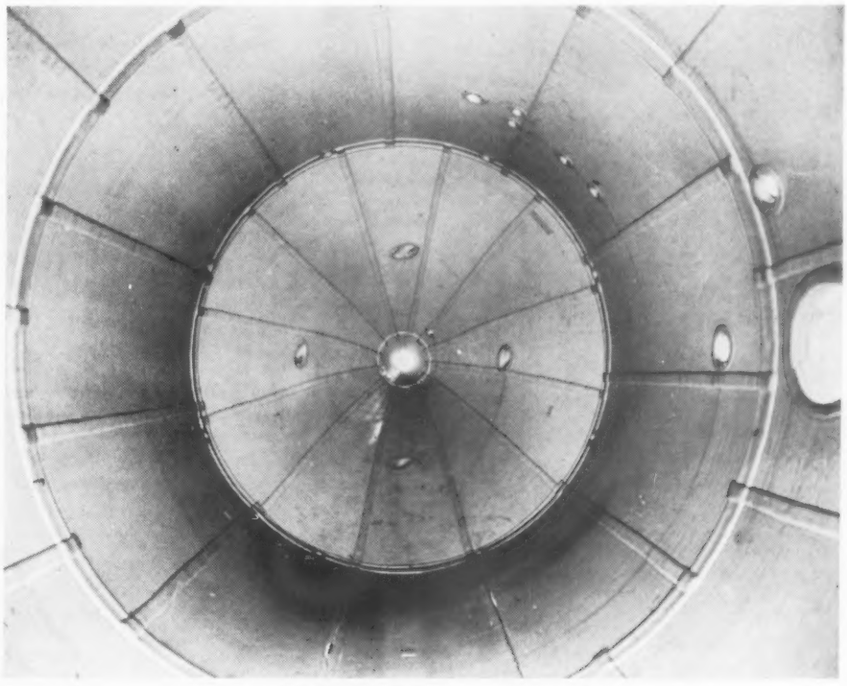
Suppose the executives in charge of a company say to themselves, "What is the lowest volume of business which we may expect in the year to come? On that volume of business, what salaries throughout the organization could we afford to pay and still make a fair minimum profit for our stockholders?" This is the arithmetic which establishes the base salaries.

Earnings Distributed

Once that has been done, all earnings above the fair minimum amount allowed for in the above calculation become just so much additional revenue to be distributed fairly among the top executives, medium executives, other employes and shareholders.

Actual working of this plan depends, of course, upon the nature and situation of the individual company. In one company the plan might be set up so as earnings increased over the minimum, employes might get increases in compensation month by month in accordance with volume of monthly earnings. This

Vacuum Crystallizer Is Rubber Lined



■ **Interior of huge vacuum crystallizer built by Swenson Evaporator Co., a division of Whiting Corp., Harvey, Ill., is lined with Triflex rubber developed by B. F. Goodrich Co., Akron, O. Salts from acid and corrosive solutions are removed by crystallization. Vulcalock process permits acid-resisting rubber to be bonded to steel shell with sufficient adhesion to withstand a vacuum of 29 inches or more. Numerous expansion joints are used**

might be 10 per cent of their base salaries; salaried employes in the middle bracket might get increases of 25 per cent over their base salaries; and top executives might get increases 75 or 100 per cent. In a different type of company these figures might be 2, 10 and 35 per cent. In another, they might be 25, 50 and 100 per cent. This would have to be worked out for each individual company. Base salary levels of employes cannot be put low. It takes a certain amount to live. On this basis the regular employe has achieved security insofar as this can be promised to him and also is given an opportunity to share in the company's good fortunes.

Provides Incentive

Situation of junior executives, key men, department heads, etc., is somewhat different. Their base rate of compensation includes a larger margin between probable income and bare cost of living. Consequently they are in a position to gamble to a certain extent. Furthermore, at this point the incentive motive begins to be important. The better they do their jobs, the more money the company makes and the more they get.

The plan is fair particularly to top executives, men really responsible to stockholders for the conduct of the company's affairs. Under this plan, if things go wrong, if they do not do a good job, or if the company is caught in a net of inevitable adverse circumstances, the top executives get minimum salaries. On the other hand if they do a good job and times are fortunate, they get good salaries.

All Get Fair Share

Of course the plan must be worked out so sum total of additional compensation paid out of additional earnings is less than total amount of such additional earnings because stockholders are entitled to some. Remember that under this plan, base salaries have been set at a low level, calculated on a basis of minimum operation. Therefore, when business goes to a higher level, all of the increased earnings resulting therefrom cannot be considered "profits" in the sense that they belong to the stockholders, for had salaries not been established on a base-plus plan, earnings would have been smaller. What is suggested is not a profit-sharing plan but it is a plan whereby salaries and wages as well as dividends to stockholders are currently adjusted to company fortunes.

In short, all parties concerned get their fair share of earnings. But if business goes bad, the company is not committed to pay anybody anything except a bare minimum.

This plan is not merely a theory. Some companies with whose affairs I am quite familiar have adopted it with great success. It is my hope that as the plan becomes more generally known, it may be extended more widely throughout industry. I believe it may go far toward helping to establish job security and to eliminate industrial unrest.

Develops Items for Carbon And Sulphur Determinati

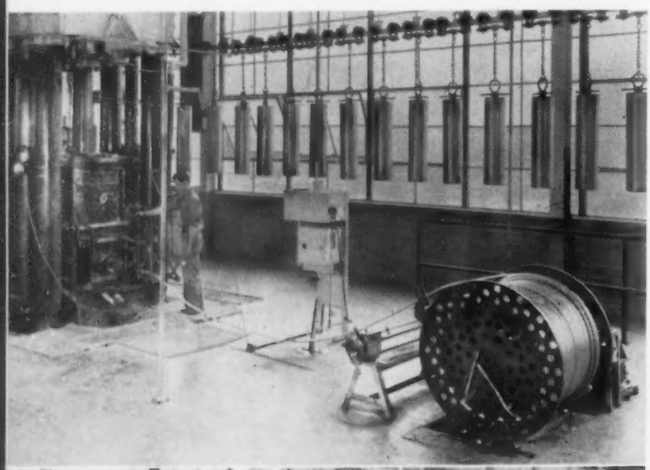
■ Carborundum Co., Niagara Falls, N. Y., is offering the improved line of Zircofrax combustion tubes, boats and boat covers, the result of two years' research. These products are suitable for use at temperatures well above those required for the analysis of modern high temperature steels and alloys. They are made from zirconium silicate.

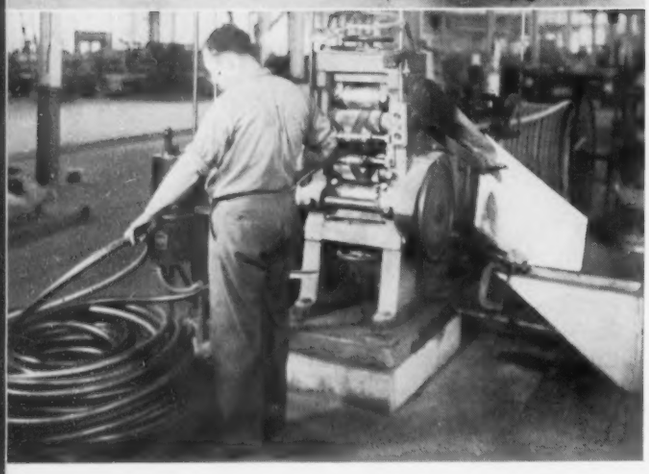
Heat Is Substituted For Pickling Operation

■ Acid fumes from pickling tanks long has been a source of trouble at plants where steel wire cloth is made. Recently four manufacturers of such cloth in York and Hanover, Pa., have developed a new process for cleaning and removing oil after weaving and before electrogalvanizing.

Foreign particles are removed by heating the cloth in a small gas-fired oven with heat traveling counterflow to the wire cloth. Steel wire cloth 30 to 48 inches wide, of 12 to 16 mesh, is cleaned successfully. The cloth travels over rollers for three horizontal passes in the oven; an air seal is mounted in the vertical feed and delivery legs of the oven. Temperature control is set for 750 degrees Fahr. Gas consumption is 0.62 therm per hour which corresponds to 56 cubic feet of 1100 B.t.u. gas or 100 cubic feet of 525 B.t.u. gas.

Wire, after heating, is a uniform dark purple color and passes directly into plating tank after traveling through a stream of air to remove any dust remaining on the wire. This new system replaces one or two caustic tanks, a water rinse, a muriatic acid bath, a second rinse tank, and a 50-kilovolt-ampere motor-generator set. It has eliminated work incidental to maintaining a critical acidity in the tanks. Installations were made in conjunction with Industrial division of Pennsylvania Gas & Electric Co., York, Pa.





Makes Rubber Hose

■ In new DeVilbiss Co. plant, Toledo, O., a lead sheath is cast around hose, and stripped upon completion of manufacturing, (below). Modern plant provides straightline production. Photos courtesy Austin Co., Cleveland

Spent Pickle Liquor

Treated by new process is completely neutralized and transformed into a building material having remarkable insulating properties. First plant under construction

■ DISPOSAL of spent pickle liquor always has presented a perplexing problem to the steel industry, for unless this industrial waste is neutralized completely before discharge into rivers and streams serious pollution may occur. Because such pollution is detrimental to fish and plant life and usually renders the water unsuitable for ordinary uses, many states have passed legislation regulating dumping of the waste liquor into streams. So important is this matter that the federal government now is engaged in a survey preparatory to enacting national laws regarding the practice.

The steel industry has recognized the importance of this problem and has spent much time and money in research to devise an effective procedure for disposal of its pickle waste. Up to the present, however, no completely satisfactory answer has resulted, each plant being obliged to work out its own solution in accordance with local conditions and regulations. High cost of most systems has constituted a stumbling block.

Acid Mostly Sulphuric

Spent liquor accrues from the operation of pickling, which, as is well known, is the process of chemical removal of surface oxides from metal by immersing the metal in a solution of sulphuric or other acids. In the case of steel, the surface oxide is mill scale, and the material is submerged in a solution of approximately 10 per cent sulphuric acid until free from scale. Fresh acid is added to the pickle bath as rapidly as acid is consumed.

The damping effect of ferrous sulphate on pickling bath efficiency is considerable. The ferrous sulphate content of a bath is five times the iron content, and it has been demonstrated that with a 40 per cent ferrous sulphate (8 per cent iron) the rate of attack of sulphuric acid on steel is reduced 50 per cent. It is common practice, therefore, to run the ferrous sulphate content up to 25 per cent (5 per cent iron), then use the solution until the acid content is reduced to less than 5 per cent, whereupon the tub is dumped and a fresh start is made with a new bath.

In the continuous production of sheet or strip steel, provision usually is made for continuous pickling so that rolling can proceed without interruption. Construction of a number of continuous mills in recent years, therefore, has resulted in a considerable increase in pickling capacity. Since these baths operate at high acid concentrations and the acid content is changing constantly, extremely close supervision is necessary to realize efficiency and economy. As a rule, the tanks are dumped at higher acid percentages than is customary in stationary installations.

These conditions have made it obligatory for mills to dispose of larger quantities of spent liquors than formerly, and consequently the problem has been aggravated. It is estimated that under normal conditions pickle waste aggregates 2000 tons, or 500,000 gallons, per day.

How Pollution Occurs

Pickle liquor when it is dumped contains not only the saturated solution of ferrous sulphate but several per cent of free sulphuric acid. A rather common practice is to kill this acid with lime in settling basins before discharging the waste liquor into streams. This satisfactorily reduces the immediate acidity, however, the ferrous sulphate gradually hydrolyzes and forms large volumes of weak sulphuric acid to cause stream pollution. Small streams, therefore, can become corrosive and, when navigable, may eat away steel piers, barges and ships' hulls. Serious damage may occur also when factories downstream use the water for cooling and condensing purposes.

Besides the temporary and unsatisfactory expedient of neutralizing the free sulphuric acid with lime, several other possibilities exist, but for the most part these have not proved commercially or economically sound. One mill, for example, neutralizes the free acid with steel scrap and then uses the solution to make copperas (ferrous sulphate), the sale of which probably more than offsets the cost of manufacture. From the viewpoint of the steel industry as a whole, this plan would be satisfactory except for the fact that in a few days the industry could produce enough copperas to supply the entire world's consumption for a year.

Most Processes Expensive

Another solution which has been worked out is a complicated process whereby the free sulphuric acid and copperas are separated and the copperas then roasted to make new sulphuric acid and a high-sulphur iron ore. This method is commercially feasible, but is not economical. The extremely large capital expenditure for plant and equipment, coupled with high operating and depreciation costs, make the disposal of pickle liquor by this process extremely expensive.

A completely new process, believed to provide a satisfactory and economical solution to the spent pickle liquor disposal problem, is just being announced by the Allied Development Corp., 1700 Standard building, Cleveland. This process, which is covered by patents, was developed as a result of intensive research and experimentation in a pilot plant in Willoughby, O. According to claims made, the pickle liquor is not only completely disposed of but it is transformed into

a useful building material possessing remarkable insulating properties. The process has the merits of being simple and inexpensive, and cost of the necessary equipment is small.

The Allied Development Corp., a new company formed to license use of the process, is closely connected with the Allied Oil Co., which for many years has sold a special inhibited sulphuric pickling acid to the steel industry. This acid, is a refinery by-product, and, curiously enough, was itself at one time a waste and stream pollution problem.

The material derived through the process is largely a co-precipitated iron hydroxide and calcium sulphate and apparently is a new composition of matter. One of the interesting points about the material, which has been designated "Ferron", is that during its manufacture it goes through a state where it is perfectly plastic and can be molded into any desired shape which later sets into a rigid mass by a combined process of drying and oxidation.

Plant Cost Is Low

It is stated that a plant having a capacity to transform 10,000 gallons of spent pickle liquor per day into 25 tons of the insulation costs approximately $50,000. Furthermore, upkeep of equipment is low, because the liquor is completely neutralized in the first operation and only a small amount of the apparatus consequently is required to handle corrosive material.

Although the process is based primarily on the treatment of sulphuric acid pickle liquors, its operation is not interfered with when the liquors of other acids are mixed in small amounts with the sulphuric liquors. This is an important point, since solutions of muriatic and nitric acids are used in some baths, notably those for stainless steels.

The first step in the process is to collect the spent liquor in a suitable tank which serves as a storage reservoir. This tank, of course, must be lined with some acid-resisting material, such as rubber or brick, or may be constructed of wood. From this tank, the liquor is pumped into two or more precipitating tanks, indicated in the accompanying illustration, and treated in batches to assure close chemical control.

Each batch is neutralized with either calcium or magnesium alkalies, such as dolomitic limestone or ordinary calcium limestone. Some other alkaline material might be employed. In any given steel plant, pickle liquor will remain fairly constant in acid and iron sulphate content, so that it is a simple matter to determine within close limits the proportions of acid and alkali for each batch.

Close Control Maintained

Conditions in the precipitating tanks are controlled carefully both as to the pH (intensity of the acid or alkali) and temperature. The tanks are heated with steam coils and the temperature is maintained at approximately 150 degrees Fahr., or well below the boiling point. Batches remain in the tanks for about an hour and during this time the free sulphuric acid and iron salts are completely neutralized and precipitated.

The next step is to remove the precipitate and pass it through filter presses. The effluent is clear, uncontaminated water which can be discharged into sewers or streams without danger of pollution, or can be used in internal plant operations. With the water removed, the press cake is Ferron in its plastic form, and this is charged into a pug mill and de-aired. Ejected from the pug mill in the form of cakes, the material is oven dried at a temperature of about 175 degrees Fahr., and afterward is cut to form as required, or ground up. For certain applications, fiber is introduced into batches in the precipitating tanks.

Sharon Steel Corp. is the first steel company to obtain a license to use the process and it is now constructing a plant at its mill in Sharon, Pa. This plant will be completed and placed in operation late in August and will have a capacity when running normally to treat 10,000 gallons of pickle liquor each day and produce from it 25 tons of insulation.

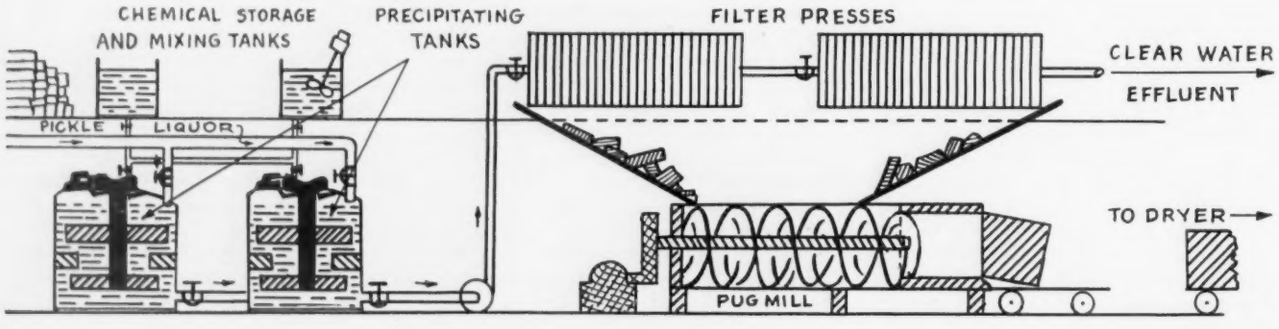
Features which are being incorporated in this plant are of interest. The building, of steel and concrete construction, is about 60 feet long and 50 feet wide, and is being erected over an underground liquor storage tank or sump which is of concrete lined with acid-resisting brick. The precipitating tanks, pug mill and dryer, will be installed on the first floor and the chemical storage and mixing tanks, filter presses and lime storage, will be located on the second floor. This will provide an extremely compact arrangement.

Characteristics of Material

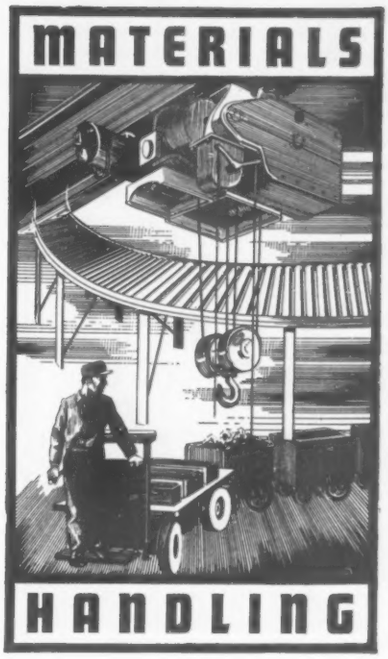
The insulating material produced from the process resembles wood in many respects, but is fireproof, termite proof, and will not warp. It also resembles plaster in other respects, although it has 550 per cent of the insulating value of plaster-made products and will stand much higher temperatures without losing its strength. Ferron resembles fired clay ware, such as brick, except that it weighs only one-third as much and can be cut, sawed and machined with ease. It is stated that 1-inch of the material affords the same insulation as 15 inches of brickwork, making it an advantageous construction for modern houses.

After drying and setting, the material is a homogeneous, solid appearing material, tan in color. It is, however, extremely porous, and if examined under the microscope reveals countless number of small air spaces. These air spaces give it its high insulating value. An ordinary brick made of Ferron will

(*Please turn to Page* 61)



This equipment neutralizes spent pickle liquor and converts it into a useful insulating material. Complete neutralization is effected in the first operation, thus only a small part of the equipment handles corrosive material



Making Bolts and Nuts

Use of pickling department with new materials handling system lowers handling and processing costs, saves in floor space and increases rod storage capacity

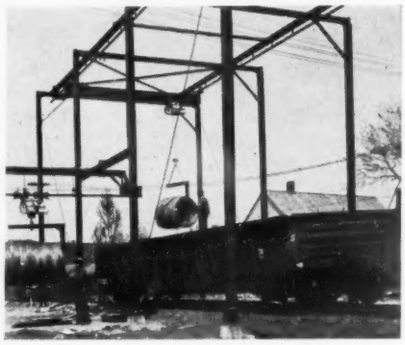


Fig. 1—Traveling monorail hoist places rod in revolving turntable

■ SEEKING a way to reduce costs, Wasmer Bolt & Nut Co., Cleveland, decided recently to buy its material in the unpickled condition, thus eliminating costly indoor storage space which had been required to store rod out of the weather. This necessitated installing a new materials handling system and a pickling and liming department. The new materials handling equipment includes a monorail system for unloading cars, storing rod in an open yard, and delivering rod through pickling and liming department to final fabricating lines.

The car unloader, Fig. 1, is a crane runway extending over the railroad spur track with an electric hoist which uses a hairpin hook to lift the coils of hot-rolled rod from the gondola cars in which they are received. The coils are removed from the car and deposited on a cup shaped turntable. Two men easily unload a car of rod in 1½ hours. The operator in the car merely deposits his load in the revolving cradle mounted alongside the railroad track whereupon the other man picks it up and places it in the storage area.

The yard-storage hoist picks up coils from turntable and runs on a monorail section between car unloading craneway and the two craneways over the storage area. Coils are then deposited where desired in the storage area using either of two craneways covering the storage area in two bays. As will be seen in accompanying illustration, crane bridges over storage areas can be interlocked with monorails between bays and between car unloader and pickling department.

These two crane runways cover 6000 square feet of storage area, Fig. 2. The coils of rod are stored here until required for production, when they are taken to the pickling and liming department, Fig. 4. This new system of handling material has reduced handling costs from 40 cents per ton to 8½ cents per ton plus a considerable saving in floor space formerly required in main shop area.

Formerly rod was received pickled and limed in box cars and unloaded by hand and stacked inside by hand. This method required 5500 square feet of floor area, while now only 1200 square feet are required making an estimated additional saving of $100.00 a month in floor space

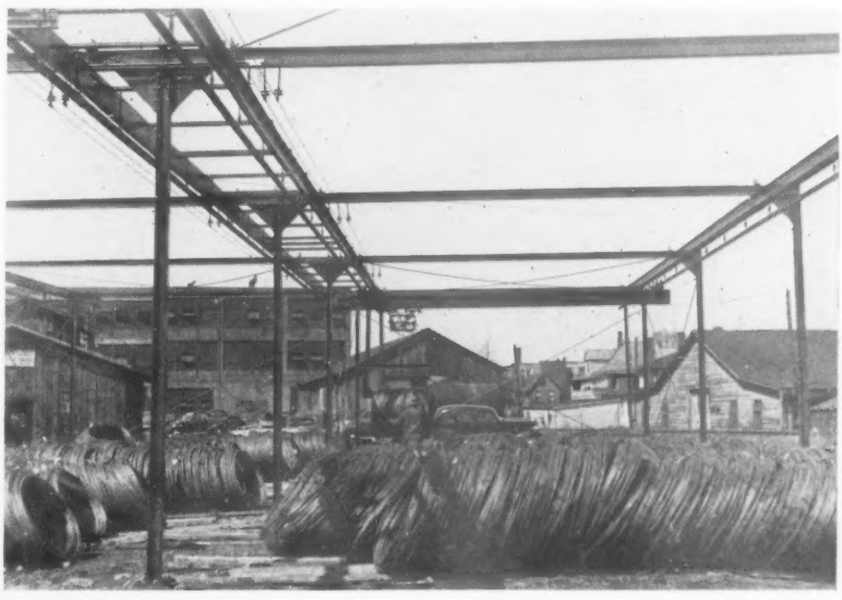


Fig. 2—Showing two traveling monorail hoist bays over storage area. Monorails interlock for transfer

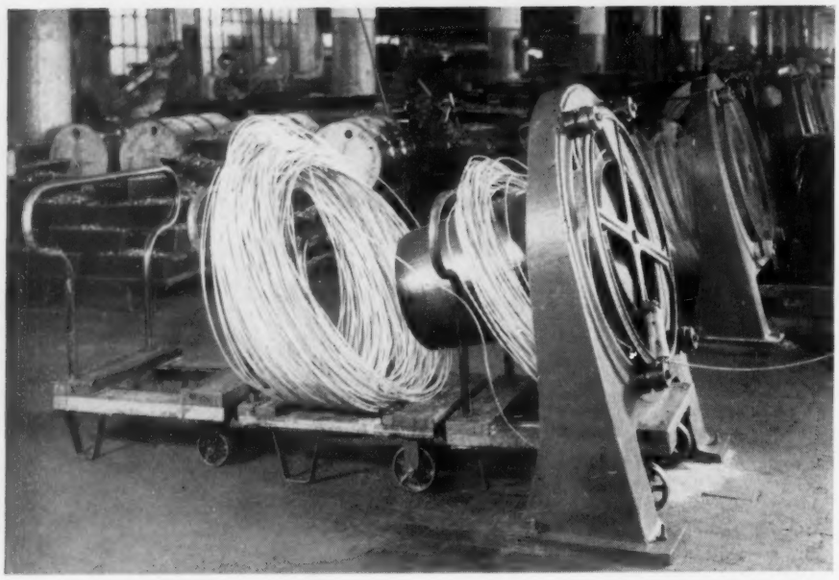


Fig. 3—Special type stationary reel with revolving head provides continuous unwinding without stopping when coil end is reached as coil ends are welded together

alone. Also freight charges were higher since it costs more to ship in box cars than in gondola type cars.

When required for production, coils are picked up on hairpin hook from storage area. The monorail hoist then transfers the coils to an interconnecting runway going to the pickling department, where coils are deposited on buggies. Coils are picked up from the buggies by another hoist utilizing special acid-resisting bronze hooks of the hairpin type upon which coils are carried while being dipped into the acid tank, rinse and succeeding lime tank.

From the lime tank the coils are placed on buggies and held in a small storage area in main plant until needed in either heading or nut-forming departments. Stock used varies in diameter fromo 15/64 to 41/64-inch and most of it has chemical analysis of 0.14 to 0.20 per cent carbon and 0.60 to 0.80 per cent manganese. Cross section of rod is either round or rectangular, depending upon whether stock is for bolts or nuts.

Use Unique Reel

From the small storage area in the plant, coils of rod for bolts are picked up by a monorail hoist and transferred to a semi-live skid shown in Fig. 3. These are two-wheeled devices with removable pipe handles, used in conjunction with a unique wire reel (patents pending) shown also in Fig. 3. This reel is fastened in the floor and consists of a heavy iron casting and a barrel-shaped drum which fits into the coil being unwound. The hot rolled rod is fed through a revolving head which is held in place by four roller bearing guides. The reel head has a tubular guide roll over which the rod passes in coming off the coil. This keeps the rod from becoming tangled and furnishes a unique unwinding method which facilitates feeding the upsetting machines.

Operates Continuously

The use of this reel has another valuable characteristic. Due to the coil remaining stationary and not revolving, it is possible, as shown in Fig. 3, to place a number of coils one behind another back of the reel. By welding ends of these coils together, it is not necessary to shut down the upsetting machine when one skid becomes empty as the reel head automatically unwinds from the coil back of it, thus making the cold drawing and upsetting a continuous operation.

This scheme has eliminated much time formerly lost in stopping and starting the headers and has made possible an increase in production of from 5 to 25 per cent, the amount of increase depending on the particular items being made.

Feeds Drawer Too

From the reel, the rod is fed into an Ajax-Hogue wire drawer and converted into wire. Without stopping, this wire is fed into header and formed into regular or special screws and bolts. The wire drawers operate intermittently, the same as the headers.

From the upsetting machines bolts go to other fabricating machines and then pass into the heat treating department. After coming from upsetters bolts are handled through subsequent operations in metal tote boxes about 18 inches long, 12 inches wide and 6 inches deep. These are stacked on skids which in turn are moved to the various machines by hand lift trucks.

Heat treating department utilizes a continuous roller-hearth furnace through which the material flows in a continuous stream. Furnace temperature is varied between 1300 and 1600 degrees Fahr. and speed of conveyor carrying work through furnace is varied to give proper treatment to the particular material be-

(*Please turn to Page* 62)

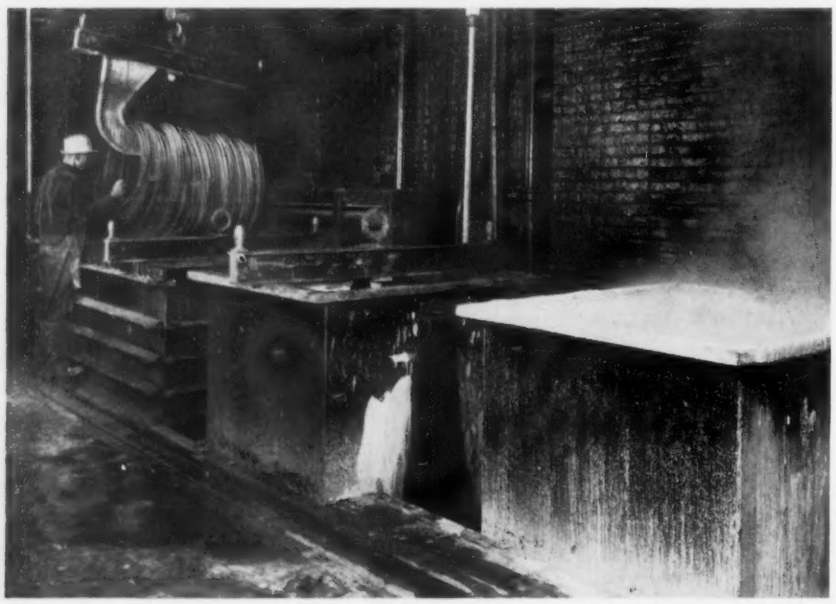
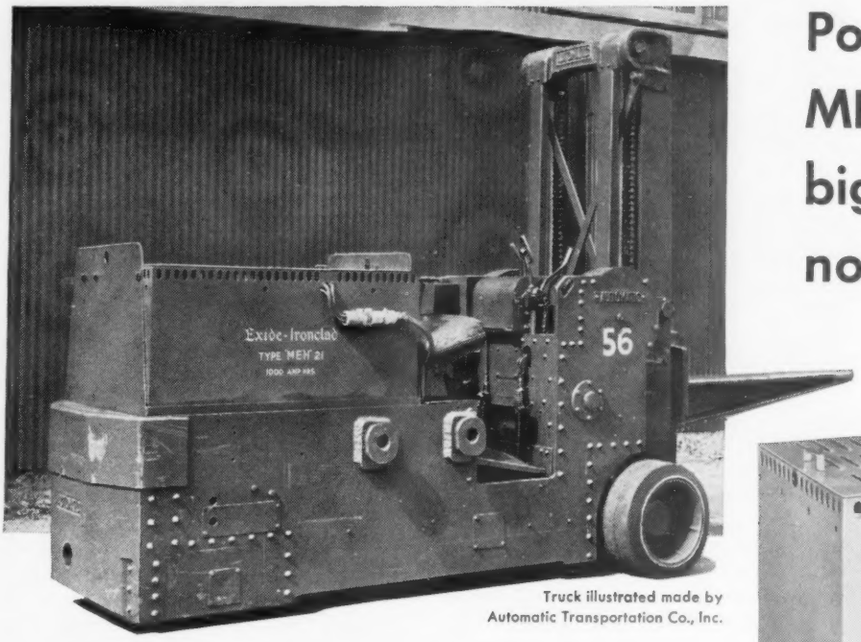


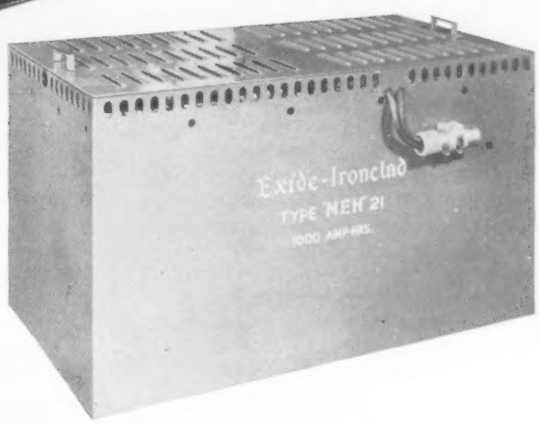
Fig. 4—Hoist with bronze hairpin hook places coils in pickling, rinse and lime baths in pickling department shown here

An outstanding truck performance

Powered with new MEH Exide-Ironclad, big ram truck makes noteworthy record



Truck illustrated made by
Automatic Transportation Co., Inc.



ONE of the country's largest sheet steel mills recently sought out the hardest job for an electric industrial truck in the entire mill. For this job they selected a 24-cell MEH-21 Exide-Ironclad Battery having a capacity of 1000 ampere-hours and 45.9 kilowatt hours—and installed it in a 16,000 lb. ram truck.

Knowing the dependability of battery power for smaller trucks, this user was interested in obtaining, if possible, the same dependable performance for the mill's largest trucks. The requirement was that the battery must be capable of propelling this big truck for at least 12 hours on one charge without a battery change.

Here is the record:

Battery	24-cell MEH-21 Exide-Ironclad
Capacity	1000 ampere-hours
In service	18 hours
Number of trips made	288
Average distance per trip	402 feet
Tons of Steel hauled	1010
Miles traveled by truck	21.36
Speed at the start	364 FPM or 4.13 MPH
Speed at the finish	343 FPM or 3.89 MPH
Average speed	358 FPM or 4.06 MPH
Closed circuit volts at start	46.6
Closed circuit volts at finish	43.86
Ampere-hours used	949

This test proves that the battery had ample capacity and power to propel the huge 16,000 lb. ram truck for 18 hours and still not to be completely discharged. It could run the truck in the hardest truck job in the mill for the required 12 hours, using only 80% of its full capacity, and still have ample reserve for an emergency — thus assuring great dependability, long battery life, and low battery depreciation.

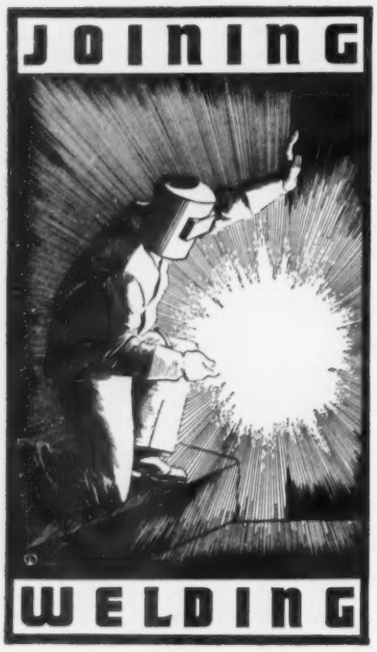
With the new line of MEH Exide-Ironclads now available, there is assured to users of electric industrial trucks of all sizes the same dependability of performance and economy for the big trucks for which the small trucks, battery equipped, have been noted.

There is no power as dependable as that of batteries for material handling trucks.

Exide
IRONCLAD
BATTERIES
With Exide **MIPOR** Separators
"MIPOR," Reg. U. S. Pat. Off.

1888 FIFTY-YEARS OF ACHIEVEMENT 1938

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto



Arc-Length Control

New method affords close control of arc voltage, permits efficient use of electrodes, helps train operators and aids in setting up procedure specifications

■ FOR YEARS, a simple accurate method of measuring and controlling direct-current arc voltages has been sought. Development work on this problem has resulted in several methods which afford a practical means of maintaining any desired arc voltage in manual direct-current arc welding.

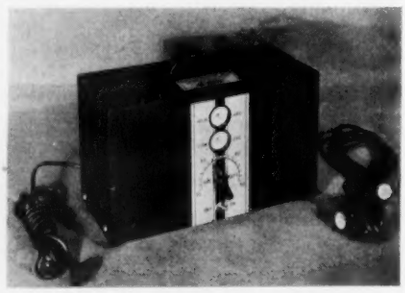
One of the chief difficulties encountered in measuring arc voltage is due to rapid fluctuations caused by metallic droplets which partially short circuit the arc in their passage from the electrode to the work. Heretofore oscillographs connected across the arc furnished probably the only accurate means of obtaining arc voltages, the photographic curve recorded by the instrument being averaged to determine the figure sought. This involved costly and intricate equipment as well as trained operators and in addition did not provide simultaneous voltage readings due to delay in developing and calculating curves.

Use of ordinary voltmeters across the arc are of little value as their reading varies widely due to voltage surges swinging the needle beyond actual voltage values.

Contains Filter

A recent development by A. O. Smith Corp., Milwaukee, applies arc voltage to the grid of a vacuum tube through a high resistance and condenser combination which effectively filters out the variations and permits a meter in the plate circuit of the tube to be calibrated in terms of average arc voltage. It also is possible to spread the scale of the meter so it covers the range of welding voltages only, increasing accuracy of the method.

Application of this instrument in the shop showed that different operators using the same electrode and welding current would weld with voltages differing as much as 4 volts. It also disclosed that some operators kept the arc voltage constant within 1 or 2 volts while others covered a range of 5 or 6 volts during welding.



Arc length Monitor affords visual check of welding operations, weighs 21 pounds, consumes 60 watts from 110-volt alternating current supply

Although such variations are not serious with some electrodes, there are others that give decidedly inferior results when welding voltage deviates as little as 3 volts. To obtain best possible results from many electrodes, the arc voltage should be maintained close to the specified value. Also too long an arc often results in presence of nitrogen in weld deposit, too short an arc giving poor penetration.

Although the instrument described permitted a bystander to observe arc voltages, it was of little aid to the operator as he must look at the arc and cannot watch the instrument. Therefore some means of indicating arc length to the operator was necessary. Accoustical signaling was first considered but was found undesirable. Final method utilizes two small flashlight bulbs which are mounted inside the operator's welding helmet, one on either side of the window through which he views the arc. These are connected to the arc length Monitor through a flexible cord. Another set of bulbs on Monitor permit supervisor or foreman to check operations.

Dial Is Calibrated

In use, the dial on the Monitor is set at the arc voltage to be maintained. This dial is calibrated from 20 to 50 volts and so covers entire range of direct-current welding. As long as operator maintains this voltage, both bulbs are dark. With a 1-volt variation, either up or down, the "high" or "low" bulb glows faintly, the glow increasing with amount of variation from voltage set. This affords not only an indication of whether arc voltage is high or low but also tells how much. As bulbs are always in operator's field of vision, his attention is not distracted from his work. Maximum brilliance is kept well below the point of hurting or damaging the operator's eyes or interfering with his work.

This indication is made possible by use of vacuum tubes in an adjustable bridge circuit set at voltage desired. Change in arc voltage then unbalances bridge in direction and amount indicated by the lamps which are fed from an alternating source through a differential transformer connected to the bridge circuit.

Chief value of this method of con-

trolling arc voltage appears to be in training new operators who acquire the ability to hold a steady arc in a fraction of the time necessary without it. Even experienced operators are shown that arc voltages varying as much as 4 or 5 volts are undesirable where uniformly high grade work is required. The use of the Monitor on every welder for a few days is found to aid operators in producing uniform work.

Men trained on one type of work can be shifted to another type much quicker if this method is used in breaking them in as it aids them in becoming accustomed to the different procedure.

In welding laboratories, especially in connection with manufacture of welding rods, this method of arc length control appears to have possibilities in determining range of best operation. It permits a series of tests to be run covering a range of accurately maintained arc voltages thus removing variations of this factor and affording a quick way to set up correct welding procedure specifications.

Prevents Adhesion Of Weld Spatter

■ To prevent adhesion of weld spatter to metals which are to be welded, General Electric Co., Schenectady, N. Y., has introduced a material called Glyptal which is applied by spraying before performing welding operations.

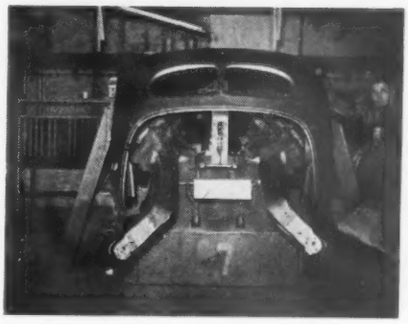
Material can be used without harm on any metal surface, including stainless steel, and will not produce carbon to make the weld hard or brittle, or reduce ductility.

Spraying rather than brushing is recommended because the former method assures a thinner coat, permitting the material to dry faster. On surfaces to be painted, this material is said to serve as a priming coat and, in addition, prevents forming of rust when applied on steel in storage yards. The preparation will withstand temperatures up to 600 degrees Cent. for one-half hour before beginning to evaporate.

Hudson Saves $3 Per Body By Electric Arc Welding

■ Use of plain butt welding with the arc is saving $3 per body at plant of Hudson Motor Car Co., Detroit. Although information has just been released, the method has been employed in fabricating thousands of bodies in the last three years.

Done in jigs, shown in lower section of accompanying illustration, roof panel and rear quarter panel are clamped in position with edges abutting. Two arc welding operators working on inside apply metal in one pass of the electrode obtaining 100 per cent penetration through the joint, thus virtually eliminating need of filling outside of the seam with solder. One dollar's worth of solder is saved per body since the electrically welded seams require only slight tinning to assure smoothness for finishing. Remainder of savings are incurred in connection with reduced tinning, forming, removing excess solder and polishing.



Upper, finished weld joining roof panel to rear quarter panel arc welded in one pass. Lower view shows massive jig employed to align parts. Operators make welds from inside body. Photos courtesy Lincoln Electric Co., Cleveland

Joint is approximately 18 inches long on the sedan, shown in the illustration, and 36 inches long on the coupe. It extends from a point adjacent to rear window to the trunk opening. There are of course two joints per body, one on either side.

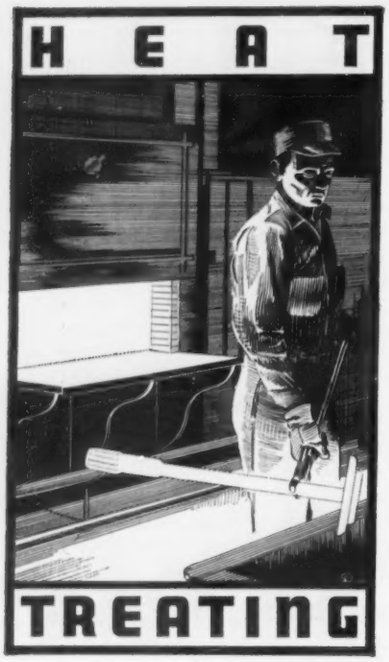
Additional savings are made possible by providing a stronger construction, free from leaks, squeaks or distortion, as well as elimination of pin holes and pop-outs formerly resulting from enameling heat.

Issues Thermocouple Reference Tables

■ "Reference Table for Iron-Constantan and Copper-Constantan Thermocouples" is the subject of research paper RP1080 just issued by United States department of commerce, national bureau of standards, Washington, as part of Journal of Research of National Bureau of Standards, Vol. 20, March, 1938. Prepared by W. F. Roeser and Andrew I. Dahl, the paper includes tables giving corresponding values of temperature and thermal electromotive force at temperatures from minus 200 to plus 1000 degrees Cent.

Varied Systems Handle Auto Bodies

■ **At this station, automobile bodies are transferred from buck to monoveyor before entering the bonderizing baths. Mechanical handling increases speed and efficiency of assembling and finishing operations. Photo courtesy Mechanical Handling Systems, Inc., Detroit**



Flame Softening

Flexible procedure eliminates excessive hardness at edges of certain flame-cut steels. Makes full strength of material available at edges subsequently welded

By H. H. MOSS
Development Engineer
The Linde Air Products Co.
New York

■ MOST FERROUS metals are easily flame cut and lend themselves readily to this simple and economical production shaping tool. Several of the low-alloy high-strength structural steels, such as the softer grades of silicon structural steels, go through the process of flame cutting quite satisfactorily. So, too, do light-gage, low-alloy chromium-phosphorus steels and others containing small amounts of nickel and molybdenum. However, all grades of steel do not react to the cutting process in the same way. In some grades the cut surface takes on physical properties differing considerably from those initially present.

It has been pointed out that flame cutting leaves a thin, hardened zone of superficial penetration on the outside edge and that with ordinary steels of 0.30 per cent carbon and under, no particular difficulty is experienced in bending or fabricating as the sorbitic hardening is not intense. With high carbon and alloy steels, however, annealing or machining should be used to remove the hardened edge.

Abstract of paper read at Thirty-eighth annual convention, International Acetylene association, Birmingham, Ala., November, 1937.

Fig. 1 illustrates effects of flame cutting on the hardness and just below the cut surfaces in various grades of steels. Standard 180-degree cold bend test or the hammer test was used. The solid circles represent surfaces which failed to pass the 180-degree bend test. Four stages of hardness are shown as determined by findings of many tests and observations. Limits of upper stages are more approximate than those of lower stages.

Low Alloys Vulnerable

The low-alloy structural grades of steel, with few exceptions, are seen to be in an extremely vulnerable position in the chart. This explains why it has been necessary for fabricating shops to machine or grind cut surfaces in these grades in order to prevent subsequent damage to the surfaces either in shop handling, assembly, erection or while in service.

Where size permits, furnace preheating and annealing after cutting has been used to overcome hardening. In steel mills, parts to be cut have sometimes been placed between hot slabs or ingots to provide sufficient body heat to prevent quenching of the cut edges. However, these are not always practical and so studies were undertaken to find a more flexible method. Localized heat treating was found to overcome the trouble and means were found to carry out the heat treating operation simultaneously with cutting for the usual

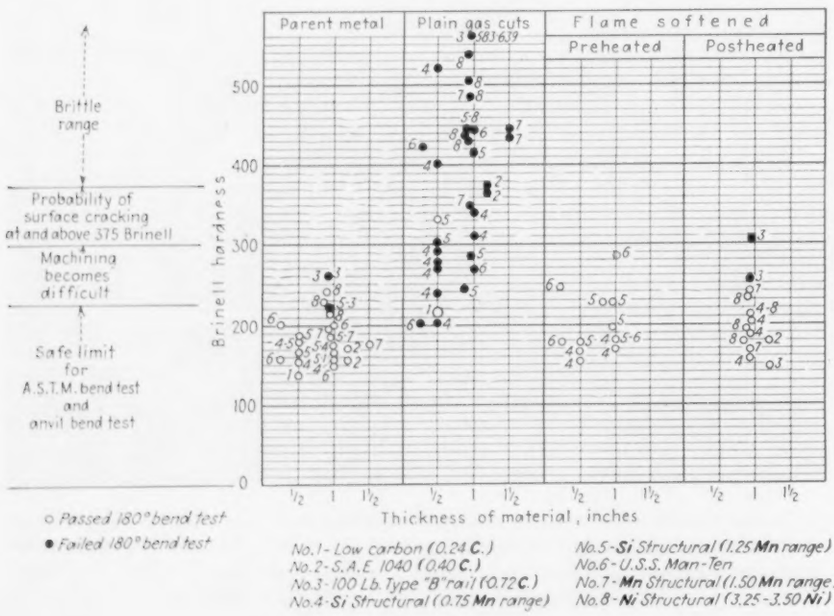


Fig. 1—Graphic representation of hardness data covering eight low-alloy structural steels

gages employed in structures, thus simplifying the operation still further.

Rapid heat flow with a suitable quantity of heat was necessary. This called for a steep temperature gradient between the source of heat and the relatively cold plate. The oxyacetylene flame provided this and the necessary quantity of heat was obtained by banking numerous flames in suitable blocks which could be manipulated about the cutting zone to effect the desired heat treatment. Simultaneous heat treating and cutting from this point required only the adjustment of heat quantity to effect a specific treatment at a specified cutting rate.

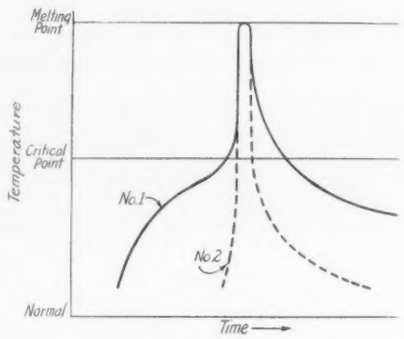


Fig. 2—Time-temperature curve for simultaneous preheating. Curve No. 1 shows type I treatment, preheating plus cutting. Curve No. 2 shows plain flame cutting

As the gage of the metal increases, it becomes more difficult to carry out the simultaneous operation due to the inaccessibility of metal deep in the narrow kerf. A point in thickness is reached where it becomes more practical to apply the localized heat treating to the cut surfaces after the parts have been separated.

Three methods for applying this heat treatment or "flame softening" method have been developed. Type I, for plate thicknesses up to 1½ inches, consists simply of heating the flame cut edge by means of oxyacetylene flames applied to the top surface of the plate along the flame cut edges.

Type II, extends the principle of Type I treatment to plate thicknesses approaching 4 inches. Here opposite surfaces, top and bottom, of the plate are heated by oxyacetylene flames issuing from multiflame heads. This type of treatment is naturally confined to edge cutting or cases where the bottom of the plate can be conveniently reached.

Type III treatment is used for heavy gages. It employs the oxyacetylene flame applied directly to face of cut after scrap has been removed or kerf opened to admit the softening apparatus. It should preferably be applied before cut surfaces cool to room temperature to prevent surface checks or cracks particularly in the case of steels that are sensitive.

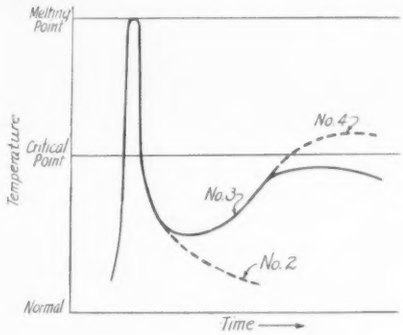


Fig. 4—Time-temperature curve No. 2 is with plain flame cutting. Curve No. 3 is Type I treatment where material is postheated below critical point. Curve No. 4 also is Type I treatment but here material is postheated above the critical

In the scope of these three treatments the grades of steel softened to date can be classified into two groups. The first includes those which harden only when rapidly quenched from temperatures above the critical point, known in flame softening terminology as "quench-hardening steels". This group includes plain carbon steels of medium-carbon content, structural steels of low-carbon and low-manganese content and some of the new corrosion-resisting low-alloy steels. The second group, known as "air-hardening steels", includes those which harden when cooled slowly in shop atmospheres from temperatures above the critical point, such as the low-alloy high-strength structural steels.

Curves Vary

Approximate characteristics of the several flame-softening treatments from the time-temperature standpoint are shown graphically in Figs. 2, 3 and 4. Fig. 2 indicates approximate slope of the time-temperature curve for preheating to a visible red color in shop daylight simultaneously with cutting. It is seen that the effect of preheating has been to raise the temperature of the steel at the moment of cutting to a point just below the critical. If desired, the preheated portion of the curve may be carried above this point for quench-hardening steels. However, it is seldom desirable or necessary.

Curve No. 1 compared to curve No. 2 of Fig. 2 allows longer time for the parent metal to cool, which in turn permits more time for the development of soft structures. Here, flame softening prevents hardening by avoiding a rapid quench following cutting. Thus it is applicable to the so-called quench-hardening steels.

Fig. 4 indicates the approximate slope of the time-temperature curve for post heating to a visible red color following cutting. This, like the application shown in Fig. 2, is a Type I treatment. In post heating, heat generated during cutting elevates the temperature of the metal to the melting point, after which the temperature drops rapidly through the critical point. Then it is elevated by post heating to a predetermined red heat and allowed to cool to normal temperatures.

For air-hardening grades requir-

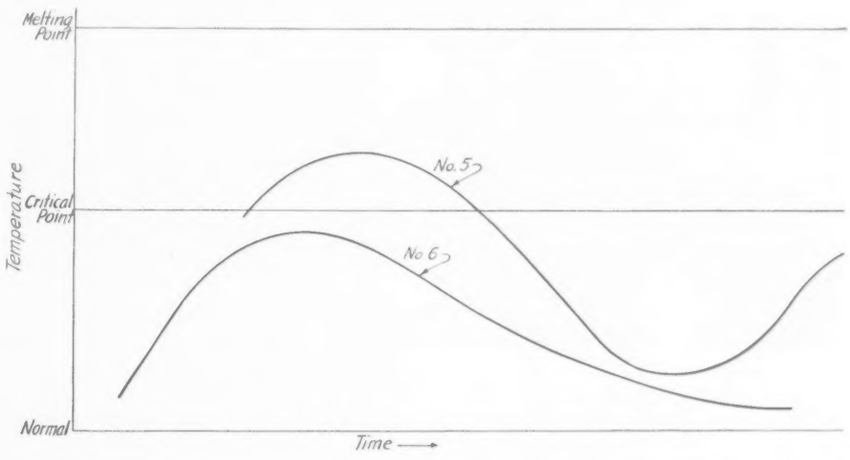


Fig. 3—Time-temperature curve No. 5 is for Type III treatment, annealing plus tempering. Curve No. 6 is plain tempering treatment

ing this type of heat treatment, such as nickel, hard grades of silicon and manganese structural steels, it is essential that the post heat not exceed the critical point. Heat treatment effected by curve No. 4 allows the hard constituents to form, whereupon they are softened by the subsequent heating operation. This treatment also is effective for softening the quench-hardening grades in which case the post heating may be carried to above the critical point of the steel if desired, to increase the rate of heating.

Separate Operations

Fig. 3 indicates types of time-temperature curves that come into play with Type III treatment, where cutting and heat treating are separate operations.

A close-up of one type of commercial apparatus developed to perform these treatments is shown in Fig. 5. This is a front view of the standard apparatus for simultaneous Type I treatment, using a single bank of 30 flames. It is shown in operation cutting and flame softening a 1-inch low-alloy steel plate. In this case the apparatus is preheating, but can readily be changed to post heating by reversing the direction of travel and moving the 30-flame head sideways to direct flames upon side of cut having the surface to be softened. These units are assembled from standard equipment.

For straight-line mechanical applications for usual fabricating shop purposes, a variable speed, portable propelling unit is employed to move the apparatus over the work. For simultaneous cutting and softening, the flame-softening equipment is merely added to standard mechanical cutting units using auxiliary brackets or fixtures. Various combinations of flame assemblies and heat-area dimensions can be obtained by grouping 7-flame or 30-flame heads and by blanking out one or more tips with plugs. When it is desired to soften one side or face of a cut or kerf by post heating, one 30-flame head usually suffices for metal thicknesses under 1½ inches. If the cut is through the body of the plate and it is desired to soften both sides or faces of the cut, two 30-flame heads should be used, one operating on either side of the kerf.

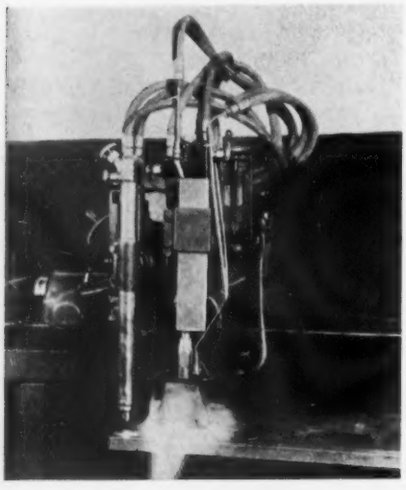


Fig. 5—Typical setup with multi-flame head flame softening prior to cutting

For Type III treatment in heavy slabs, economy may be obtained by banking two or more heads abreast. For small cuts and those inaccessible to mechanical equipment, the 7-flame hand blowpipe has been found most useful.

Certain aspects of flame softening are covered by patents and patents pending. However, the processes, as presented, are available to the fabricating industry through license agreements.

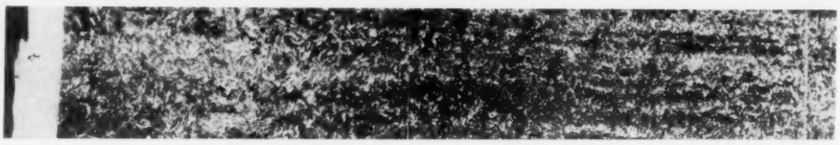
Depth Determined

Macroscopic and microscopic tests of the heat-affected zones of plain and flame-softened cuts, the latter using post heat, were made concurrently by Union Carbide and Carbon Research Laboratories, Inc. in nickel, silicon and manganese structural steels to ascertain the depth of these zones below the surface of the cut and the character of their structural constituents.

Depth of zones heated to temperatures which were high enough to alter the internal structures of the steel and thus change their physical properties were found to approximate 0.04 to 0.08-inch in 1-inch thick steel, the narrow depth applying to structural silicon steel, the intermediate depth to structural manganese steel and the maximum depth to structural nickel steel. These depths are not materially altered in the heavier gages. However, as the hardness in these affected zones graduates to the normal hardness of the unaffected parent metal, depth of injurious hardening is actually somewhat less than depths mentioned.

With each steel, the flame-softening operation either prevented the formation of or tempered the hard constituent and thereby eliminated the structure representing the brittle condition. Therefore it was the laboratory's conclusion that the steel in the heat-affected zone is given a desirable combination of hardness and ductility, and with post heat treatment the hard structure produced by usual flame-cutting procedures is tempered to a practically ideal condition.

Fig. 6—Grain structure at cut edge of unsoftened nickel steel specimen



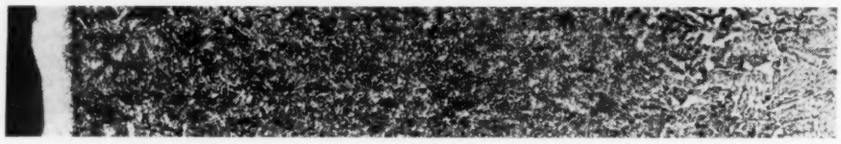


Fig. 7—Same steel shown in Fig. 6 but softened by post heating

Photomicrographs shown in Fig. 6 and 7 bear out these representations. Fig. 6 shows structure at cut edge of an unsoftened nickel steel specimen. The narrow white band along cut edge at left-hand side of the print may be an oxide, although appearing as austenite at this magnification. Its thickness is only a few thousandths of an inch and it is relatively soft. The dark material at interior edge of this band is martensite that has begun to separate from the white constituent while the dark material immediately to right of the white band is martensite which extends for a depth of about 0.06-inch. Then comes a transition zone which includes more and more of the white ferrite, and finally at the extreme right is shown the unaffected steel whose structure consists of ferrite and the dark pearlite.

Fig. 7 shows structure of a specimen from the same nickel steel as that in Fig. 6, but in this case the post heating treatment was applied. Material in the narrow white band

proved quite stable and was not appreciably altered by post heating. However, the martensite has been tempered to a considerable degree. The acicular constituent and clear-cut Widmanstattenlike arrangement shown in Fig. 6 has been practically eliminated. Transition zone between tempered martensite and original structure is wider in the post heated specimen.

Flame-softened cut edges in a representative group of high-tensile structural steels also were subjected to drift testing, since certain specifications for these steels require this test. Results demonstrated the ability of flame-softened edges to withstand tests of this character.

Three Grades Tested

Large tension bars with edges prepared by several methods were tested to provide a practical example of their effect upon the overall physical properties, using three grades of high-tensile structural steel. Each series embraced machined, plain flame-cut and flame-softened flame-cut edges. Physical properties of bars having flame-softened edges were found to be in good agreement with those having planed edges, in contrast to plain flame-cut bars which failed at reduced loads.

Cost of flame softening for Types I and II treatments is mainly a matter of increased gas consumption as the operation is carried out simultaneously with cutting and at the usual cutting speeds. No appreciable amount of extra labor is involved.

For the Type III treatment, not simultaneous with cutting, costs involve both additional gases and labor. However, this treatment usually is conducted at a faster rate of speed. Therefore cost may be only slightly greater than that for Types I and II treatments for same area softened.

For estimating purposes, volume of oxygen and acetylene for softening ¾ to 1¼-inch steel by Type I treatment may be figured at approximately 2 cubic feet of each gas per lineal foot of cut for each side of the kerf softened. For Type II treatment, the consumption is somewhat lower. For Type III treatment, equivalent surface areas can be softened with approximately 33 to 50 per cent less gas.

♦

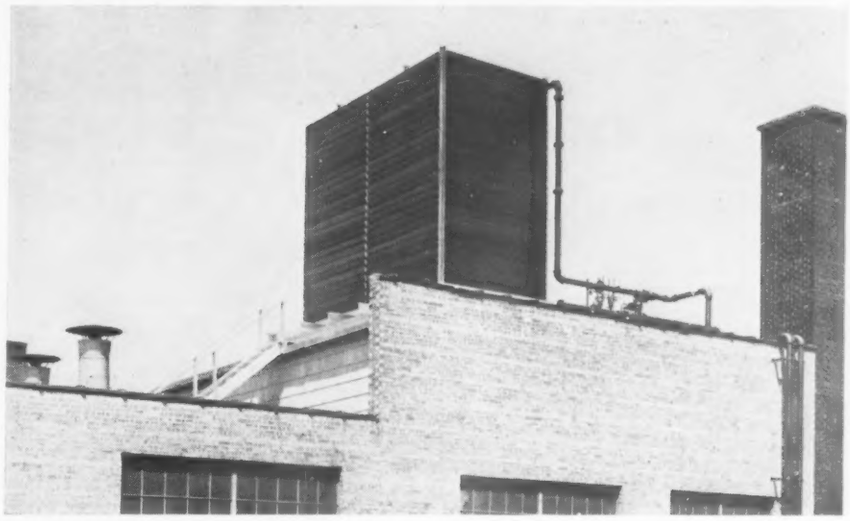
Issues New Standards for Motors and Generators

■ National Electrical Manufacturers association announces "NEMA Motor and Generator Standards," publication No. 38-49, which supersedes the previous edition of the standards, publication No. 34-22, issued in 1934. This book contains all the information in the previous edition somewhat modified and augmented.

Some of the new material includes temperature ratings of various types of enclosed motors, standardized lettering for flange mounted motors, method of measuring motor vibration, etc. The section dealing with adjustable-speed direct-current motors has been revised to give the horsepower rating for continuous, 1-hour and tapered duty. A new standard which should prove of interest is a table of maximum speeds by field weakening for constant-speed direct-current motors having standard horsepower and speed ratings.

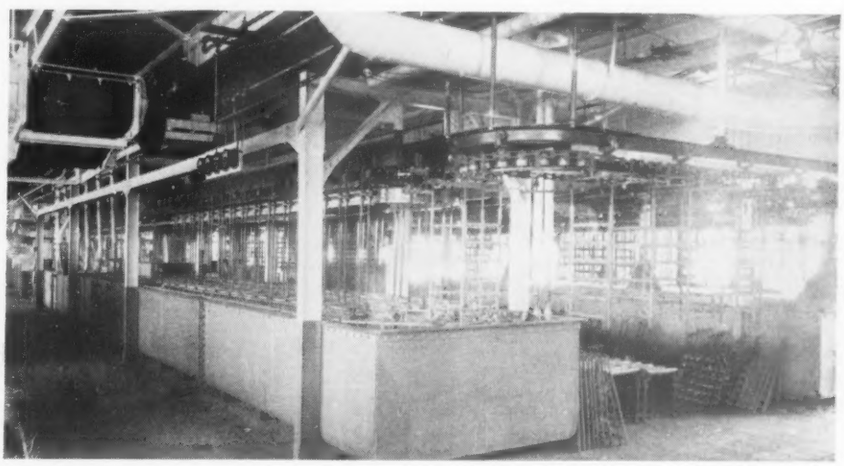
Copies of the publication can be obtained from the association headquarters, 155 East Forty-fourth street, New York, for $2 a copy.

New Plant Tests Cooling Towers



■ **Steel substructure was erected on roof of Binks Mfg. Co., plant, Chicago, recently. It is designed to hold atmospheric type towers such as the unit shown and also forced draft and induced draft types. Used with suitable pump, and heating system, complete performance data may be obtained**

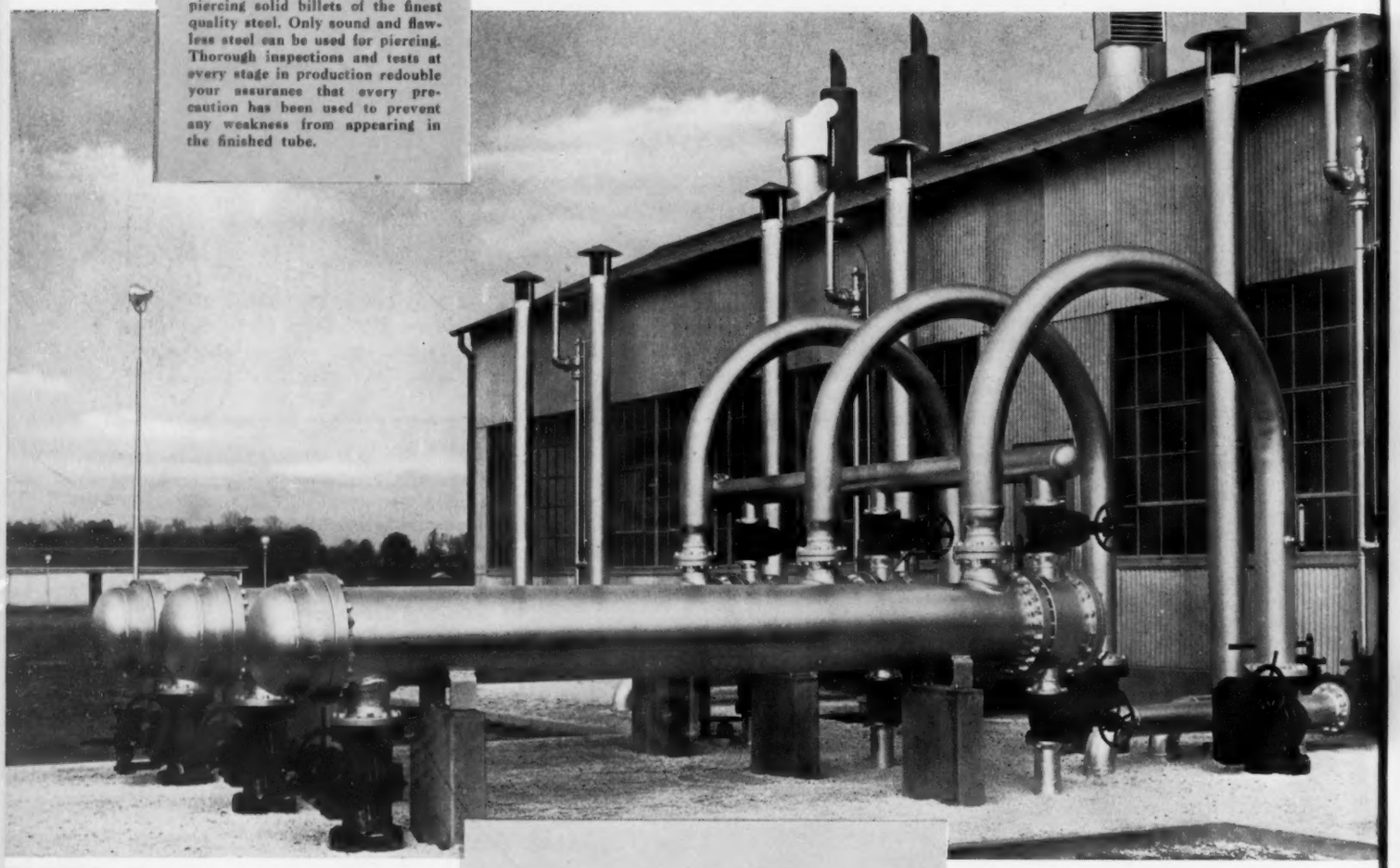
Electroplates Automatically



■ **National Cash Register Co., Dayton, O., electroplates a large volume of small items such as nameplates in this automatic nickel plating machine, which is part of one of the largest automatic plating installations in use today. Work is hung on hooks carried on racks which travel through the various baths on chain conveyors as shown. A large overhead belt conveyor is seen in upper left hand corner**

SEAMLESS . .

THE NATIONAL SEAMLESS process consists, fundamentally, of piercing solid billets of the finest quality steel. Only sound and flawless steel can be used for piercing. Thorough inspections and tests at every stage in production redouble your assurance that every precaution has been used to prevent any weakness from appearing in the finished tube.

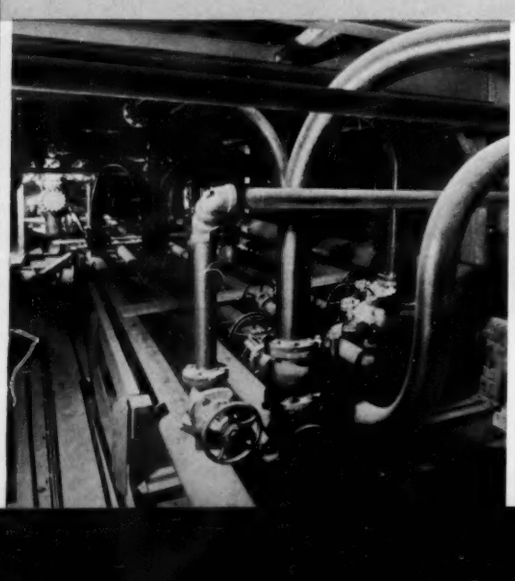


THESE GAS DISCHARGE MANIFOLDS *in the new compressor station of a prominent Natural Gas Company required pipe that would withstand bending and still operate safely at high pressures. Naturally the choice went to* NATIONAL *Seamless Pipe.*

• • •

POWER PLANTS *are now being designed for higher and higher pressures. Experienced engineers and specification writers unhesitatingly place seamless at the top of the list of acceptable materials; in fact, for severe or hazardous service, the use of seamless is frequently mandatory.*

FOR OIL, GAS, AND GASOLINE LINES, NATIONAL *Seamless is widely accepted as the finest available pipe. A cross-section of the country's outstanding modern pipe lines shows predominant use of* NATIONAL *Seamless. Here is the final link of the line serving Detroit with natural gas from the Texas fields, a 230-mile line of 22-inch* NATIONAL *Seamless.*



IN THE OIL FIELDS *spectacular advances have been made in deep drilling; wells now extending more than two miles down. A large share of the credit goes to* NATIONAL *Seamless Drill Pipe because it withstands the racking strains encountered.* NATIONAL *Seamless Casing and Tubing have also contributed materially to profitable oil production.*

First Choice for jobs which *must not fail!*

FOR MACHINE PARTS SHELBY *Seamless Mechanical Tubing, a product of National Tube, is the acknowledged trade standard.* SHELBY *is popular with designers because it is available in so many grades, shapes, and sizes—with machinists because it machines so readily, has no hard spots—with parts buyers because of its unvarying quality.*

INDUSTRY demands dependable pipe and tubing. New requirements of safety in operation and durability in service can be satisfied only with tubular products that offer *maximum* dependability at *minimum* service costs.

Among all methods for making pipe and tubes, the Seamless Process is unique in that it offers dependability in the highest degree. Only seamless gives you the complete security of uniform wall strength, because only seamless has no weld — no long line of potential weakness.

Industrial men now realize that NATIONAL Seamless supplies the answer to hundreds of difficult problems, and they apply it wherever maximum dependability in pipe service is essential. In power plants for safer handling of high-pressure steam; in pipe lines transmitting oil, gas, and water at high pressures; in vital parts of automobiles, aircraft, and industrial machinery; in deeper oil-well drilling; in fact, today, throughout all industry, the superiority of seamless is a matter of record.

Whenever you need a pipe that has an extra margin of safety, pipe that must not fail, use NATIONAL Seamless. Available in sizes from 3/16-inch mechanical tubing to 24-inch O.D. pipe.

BOILERS *for stationary, railroad, and marine service have one requirement in common—they must be built to handle pressures safely and economically. Power men agree that* NATIONAL *Seamless Boiler Tubes can't be beaten for all-round dependability.*

WHEN AIRCRAFT BUILDERS *adopt a tubing, you can be sure they have selected the best on the market. Here, in the famous "Flying Fortress," the fuselage struts, longeron tubes, engine mounts, landing gear, and wing spars are all made from* SHELBY *Seamless Aircraft Tubing. In America's finest ships, you'll find America's finest tubing—*SHELBY *Seamless.*

AUTOMOBILE PARTS *require tubing of unvarying quality for axles, housings, steering columns, tie rods, torque tubes, and other vital parts. In 1937, one manufacturer alone purchased more than a million steering column tubes of* SHELBY *Seamless. Over 99½% of these million tubes were acceptable—mill rejections averaged only a small fraction of one per cent!*

HOW TO GET REAL PIPE SERVICE!

TO learn the true meaning of service, call the NATIONAL Distributor in your vicinity whenever you are faced with a problem involving pipes and tubes. He can offer you valuable counsel, based on a vast store of practical experience.

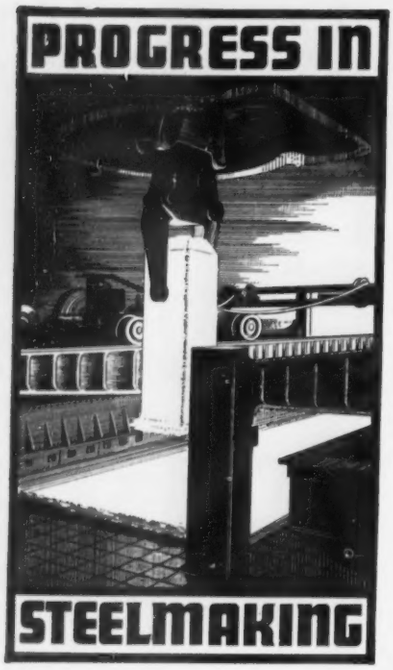
You will find him a valuable contact for everything tubular, both seamless and welded, ready to handle your requirements promptly and intelligently.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*. United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL



Cold Rolled Sheets

Severe drawing performance required in sheets for automobile bodies, refrigerators and furniture demands a product with improved physical properties and superior finish

By JOSEPH C. ECKEL
Carnegie-Illinois Steel Corp.
Pittsburgh

ACCOMPANYING article constitutes a paper presented before the third biennial Pennsylvania interchapter meeting of the American Society for Metals at Pennsylvania State college, State College, Pa., May 20-21. The author, since 1936 assistant manager of sales, sheet division, Carnegie-Illinois Steel Corp., previously had long experience in the sheet mill operating department

■ LIGHT gages, larger sizes, better surfaces, improved physical properties, and abnormally low breakage, defines the characteristics desired in cold reduced sheets by those engaged in fabricating sheet steel parts.

For the sheet manufacturer successfully to aid those engaged in fabricating the great variety of intricate stampings, a knowledge of the design of the part, design of the dies, forming practice to be employed, method of finishing, and type of service to which the article is to be subjected, is essential in the production of suitable material.

The most desirable data, of course, are the accumulated evidence obtained from the performance of a material under a definite set of shop conditions, but unfortunately the redesigning of old parts and introduction of new designs compels the fabricator and the sheet producer to abandon this field as a source of information as such data are not available for the redesigned or the newly designed parts.

Influence of Variables

In setting up processes and treatments for cold reduced sheets, there are important variables to be considered, such as chemical composition, grain size, mechanical and thermal treatments. As grain size exercises a decided influence upon the stamping properties as well as the surface of the part after forming, it is only natural to direct attention to this essential factor.

Prior to introduction of the present heat treating or normalizing furnaces, the sheet manufacturer utilized the only facilities at his command, namely, open annealing and box annealing. This equipment proved adequate until the modernistic designs of automobiles, mechanical refrigerators, metal caskets, vaults, and many other stamping parts, necessitated forming operations of such severity that successful performance in the dies without excessive breakage and smooth surfaces after drawing could not be obtained. When fabricators encountered excessive breakage and unsatisfactory surface conditions, the problem became one of mutual interest to both fabricator and sheet producer. By co-operation of both parties corrective measures were immediately instituted.

Minimize Breakage

Heat treating furnaces of the continuous type were developed, which enabled the sheet producer to raise the material to a temperature of not less than 1650 degrees Fahr. and cool relatively quickly to obtain a small grain structure which would minimize breakage and would produce stampings free from coarse pulling, or "orange peel" as it has been termed.

Designs of drawn parts with reasonable radii can be made from sheets with considerable variation in grain size without entailing abnormal breakage or without disturbing the surface to an objectionable extent. Some designs, particularly in the automobile, casket, vault and refrigerator industries, however, are susceptible to fluting and development of stretcher strains. These difficulties can be reduced and in some cases entirely eliminated by cold working the sheets at the producer's mill, followed by roller leveling in the plant of the fabricator prior to forming. In the automobile field, roller leveling is considered essential in connection with forming operations.

In forming of some drawn parts, certain areas may become critically strained on account of cold working. If the design provides for an intermediate annealing operation, the critical range of 1290 to 1650 degrees Fahr. should be avoided as grain growth and breakage in the next drawing operation are liable to occur.

Should such difficulties develop, the use of temperatures from 900 to 1200 degrees Fahr. should be tried to determine if the drawing strains can be relieved and grain growth prevented. The next forming operation will determine quickly whether the correct annealing temperatures have been selected. Should breakage occur, the stampings should then be annealed at not less than 1650 degrees Fahr., cleaned and redrawn. This temperature should produce a satisfactory structure.

The reduction employed in producing cold rolled strip or cold re-

duced strip sheet usually is 30 per cent or greater, which reduction causes the strip or sheet to become overstrained, thus permitting the employment of annealing temperatures within the critical range, the grain size being small and uniform. This extreme cold reduction practically destroys any existing grain structure while cold reduction within a range of about 7 to 15 per cent distorts but does not destroy the original grain size; thus leaving the original grains, even though distorted, free to grow at temperatures within the critical range, provided all other variables such as composition, time, and temperature are favorable.

Relieves Stress

In the case of cold reductions of 30 per cent or greater, where the total destruction of the grains has occurred, temperatures within the critical range can be used which relieve the internal stresses creating conditions favorable to the development of small and uniform grains, provided the other variables just mentioned have functioned properly.

A sheet with a small uniform grain, even though stiffer, is preferred by some fabricators, particularly if it is desired to avoid coarse pulling. On the other hand, a preference for a softer sheet may be desired by other fabricators though the finished part may have a tendency toward coarseness.

Production of cold reduced sheets has prompted extensive use of various methods of testing. Those most generally used are the tensile test, the Olsen and Erichsen "cupping" tests, and the Rockwell hardness test. In addition to physical testing, metallography has played an important part.

Present methods of testing, chemical and metallographic, provide the sheet manufacturer with excellent indicators, but after all, the story is still untold until a production run has been put over the dies and the forming results known. It would be difficult, if not impossible, to design a testing machine which could combine and reveal all of the factors involved in forming the various parts of an automobile. It would likewise be just as difficult to present in specification form all of the variables involved in the manufacture of cold reduced sheets.

As the knowledge of physical testing developed, attempts were made to express this knowledge in terms of specifications, some of which provided not only for the composition of the material but that it possess certain physical properties. The sheet manufacturer naturally was disturbed over specifications of this character, as the chemical composition specified in some cases made it extremely difficult if not impossible to meet the required physical tests. Fortunately, modifications of such specifications were obtained readily, to permit the producer to observe either the chemical composition or the physical properties, but not both. Specifications based upon physical tests which have been co-ordinated with actual shop runs over a period of time are of material assistance to the sheet manufacturer.

In the automotive industry, sheets for such parts as fenders, aprons, tire covers, radiator casings, lamps, hood tops, sides, cowls, quarter and back panels, and all-steel tops, must possess a high surface standard, the correct physical properties, and a flatness standard suitable for the part.

The requirements for the exposed parts of refrigerators are similar to those for the automotive industry. Surface and the flatness standards of metal furniture are similar to those for exposed refrigerator parts.

Flatness Essential

Rail passenger car equipment, such as sides and exposed interior trim for both conventional and streamline trains, requires sheets of a good surface and a high standard of flatness, whether constructed of mild steel, copper steel, or high-tensile steel.

The domestic appliance industry has presented many interesting but difficult drawing requirements in connection with such items as the porcelain enameled washing machine tub, the pressed steel kitchen sink, and more recently the sheet steel bath tub.

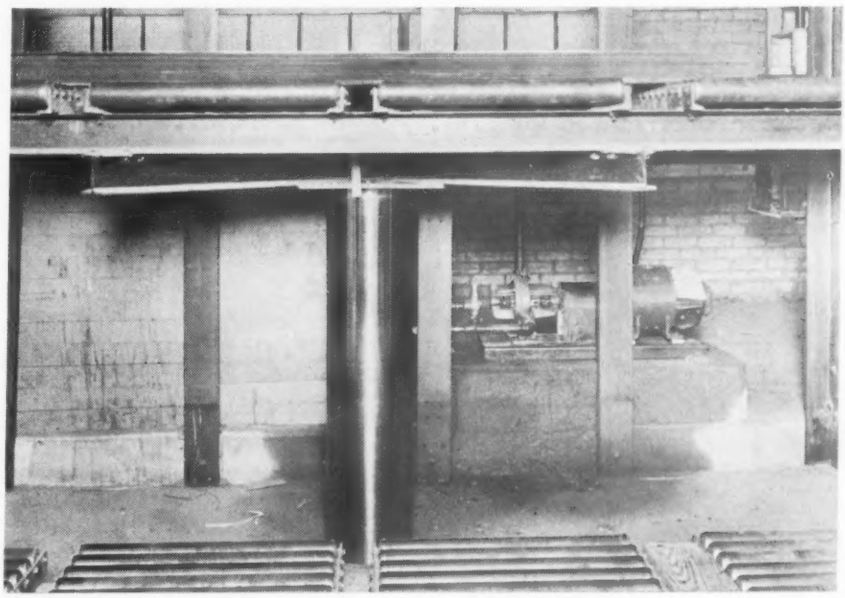
In designing a new part, or in redesigning an old part, ambition of the designer is to create objects possessing irresistible sales appeal. The realization of this ambition depends upon the ability and skill of the fabricator not only to design but to build dies in which the creations of the designer can be formed in as few drawing operations as possible without resorting to intermediate annealings and without exceeding the physical limits of the present cold reduced sheets.

Develops Materials for High Temperatures

■ Two products, Coprtex high temperature block and Coprtex heat insulating cement for service in high temperature equipment have been placed on the market by Armstrong Cork Products Co., Lancaster, Pa.

Features of Coprtex block are; a high temperature limit of 1800 degrees Fahr.; low lineal shrinkage; insulating efficiency; high modulus of rupture; accommodation of rivet heads and similar projections and availability in special as well as standard shapes. The Coprtex cement is recommended for its high temperature limit, low lineal shrinkage, insulating efficiency, salvage properties and ease of application.

Hoist Lifts Roller Conveyors



■ Many installations of air hoists for bringing sections of conveyors to loading levels have been made recently. Photo courtesy Curtis Pneumatic Machinery Co., St. Louis

Builds Huge Paint Stripping System

■ Hot alkali stripping system shown above is claimed as largest yet built. Made by Detroit Rex Products Co., Detroit, the system consists of two main tanks, an auxiliary premix tank, hood arrangement, I-beam monorail conveyor and traction wheel turns built integral with the unit. All-welded construction uses ¼-inch steel plate for tanks reinforced with steel angle sections. Capacity of hot alkali strip tank is 15,400 gallons; rinse tank, 8000 gallons; mixing and preheating tank, 1500 gallons

New Finishing Material Speeds Up Production

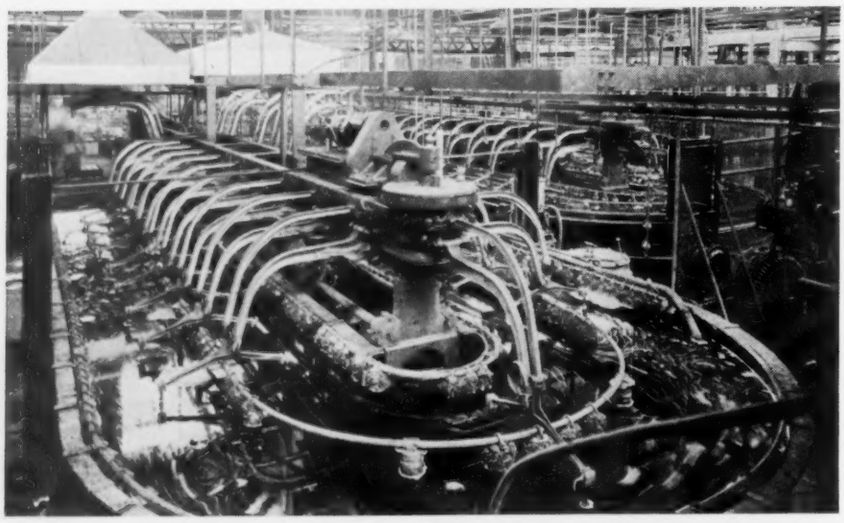
■ A new enamel for industrial finishing has been announced by E. I. du Pont de Nemours Co., Wilmington, Del. Known as Short-Bake "Dulux," this new finish is claimed to speed up production. Its shorter baking time (8 to 10 minutes at 350 degrees) allows a greater output with smaller ovens.

In addition to its shorter baking time, the new finishing material demonstrates satisfactory adhesion to metal and good hiding in one coat. It may be applied on solvent-cleaned steel, bonderited steel or primed steel. It shows hardness, mar resistance, flexibility and high resistance to grease, soap and alkali. White or colors are available.

Proper Finish Standards

■ A scale of standards for surface finishes was proposed by James Weaver, director of equipment, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in a recent address before the Pittsburgh chapter of the American Society of Tool Engineers. According to the proposal, finish grades would be divided into 10 classifications, ranging from 0 for the roughest to No. 9 for the smoothest No. 0 would designate a surface finish with an average depth of scratches, tool marks or serrations of 0.063-inch. No. 9 would designate a surface with scratches approximately four one-millionths of an inch in depth. This is somewhat coarser than a finely lapped surface. Johansson gage blocks, for instance, have a standard of one one-millionth of an inch for surface marks. Instruments for measuring surface marks are already available, Mr. Weaver said.

Synthetic Material Prevents Rack Deposits



■ Bright nickel plating is done in two Triflex rubber-lined steel tanks at the Knapp-Monarch Co., St. Louis. All plating racks are coated with Korolac, a rubber-like material developed by B. F. Goodrich Co., Akron, O. It eliminates loss of nickel previously plated out on the racks. Fewer rack replacements and more uniform plating are reported

Hose Has Cellulose Seal

■ Chicago Metal Hose Co., Maywood, Ill., has developed a new hose for oil connections. It utilizes a multiple cellulose sheet seal over a flexible metal core to provide permanent resistance to action of oil at any operating temperature. Unlimited flexing life is claimed.

Refractory Standards

■ The 1937 manual of A.S.T.M. standards on refractory materials gives in their latest form all specifications, test methods, and definitions developed in this field by American Society for Testing Materials. It includes detailed tables of composition of standard samples of refractory materials, latest method for interpretation of refractory test data, comprehensive surveys of refractory conditions in open-hearth practice, malleable iron industry and by-product coke ovens in addition to the copper, lead and glass industries.

Specification requirements cover various types of fireclay brick, ground fireclay and other refractories. Test methods include chemical analysis, cold crushing tests, high-temperature heat insulation, tests for resistance to spalling, particle size, permanent linear change after reheating, porosity and permanent volume changes, and pyrometric cone equivalent.

Copies of this 180-page publication in heavy paper cover can be obtained from the society's headquarters, 260 S. Broad street, Philadelphia, at $1.25 each.

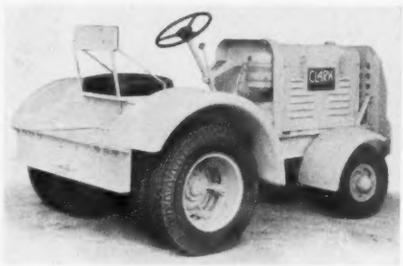
Develops New Twin Hose

■ Electric Hose & Rubber Co., Wilmington, Del., makers of Supero-Siameez hose, announces Electric-Siameez hose, a new grade using two lines of high quality regular 2-braid hose, joined together by the same integrally molded web used with Supero and Junior grades.

NEW METAL PRODUCTS

■ Especially designed for heavy industrial haulage jobs, a new tractor developing drawbar pull as high as 4400 pounds has been introduced by Clark Tructractor Co., 1936 Ezra street, Battle Creek, Mich.

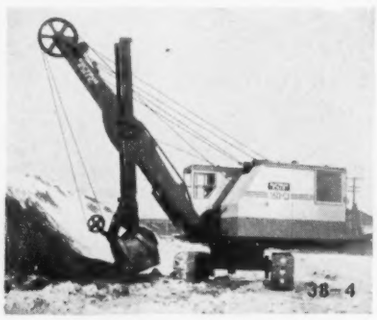
Tractor is built in three capacities —3300, 4000 and 4400 pounds drawbar pull. It has a 59-inch wheelbase, 112-inch turning radius, a speed of



11 miles per hour and will tow 70 to 85 tons on level roadway. Power is provided by a 6-cylinder, 46-horsepower gasoline engine, equipped with self-starter, oil bath air cleaner and renewable cartridge type oil filter. Both front and rear fenders are removable.

■ Embodying engineering features recently built into larger excavators, another 1-yard power shovel, convertible to dragline, clamshell, crane or dragshovel, has been announced to the excavating field by Bucyrus-Erie Co., South Milwaukee, Wis.

This machine, known as 29-B, is equipped with a speed type cast V-front welded dipper, easy filling and quick dumping, fitted with forged tool steel teeth, which are quickly reversed or replaced. Reinforcing diaphragms are welded into the light, all-welded boom, and extra large 36-inch boom-point sheaves contribute to good digging angles and long rope wear. Powerful traction is provided by single shaft drive cats, facilitating easy climbing and accurate steering. A worm-drive boom hoist is standard equipment, but a special independent highspeed power up and power down live boom hoist is available. Gasoline, diesel or electric power is delivered through a straight line transmission with gears enclosed and running in oil.



■ An improved line of jack screws in 38 sizes has been developed by Duff-Norton Mfg. Co., Pittsburgh, incorporating a roller bearing device which prevents jack from twisting under load, assuring smoother lift with a minimum of effort.

Load friction is reduced by the use of a full complement of chromium molybdenum steel balls around grease-packed bearing race of the jack top. Other features include a solid one-piece base of cast steel with a double-ribbed collar reinforcement around threaded area of casting, and a one-piece steel screw with forged steel head. Top is unbreakable drop-forged steel and is attached without use of pins.

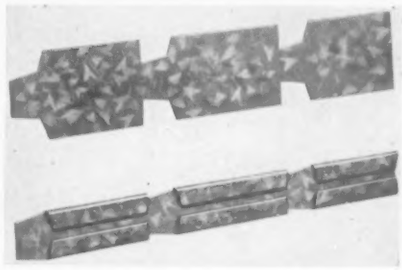
■ Unique in its field is an automatic electric range that has a built-in room heating system and is

equipped to cook and bake with coal, wood or oil.

Recently presented by Renown Stove Co., Owosso, Mich., this range is finished in enameled steel and has sleek, modern lines. Simplified heat control is entirely automatic. An air circulating system is built into the unit for use in homes which require a source of heat in the kitchen.

■ A labor-saving method of manufacturing drive cleats, developed by Whitney Metal Tool Co., Rockford, Ill., combines use of a kick press, equipped with a special notching punch and die, with a duplex rolling machine.

Blanks are punched out on kick press, and are then put into rolling machine where sides are folded in accurately to form cleats, as shown in illustration. The long strips are delivered to job, where duct in-



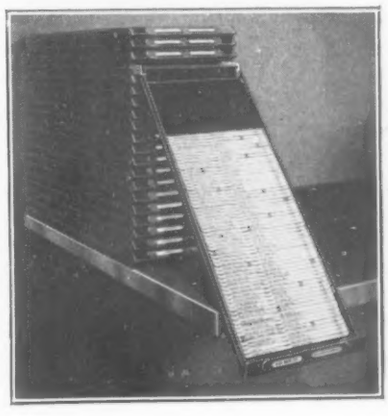
staller simply snips off cleat, cutting through only one thickness of metal. Ends of cleat are open, ready to be slipped into position.

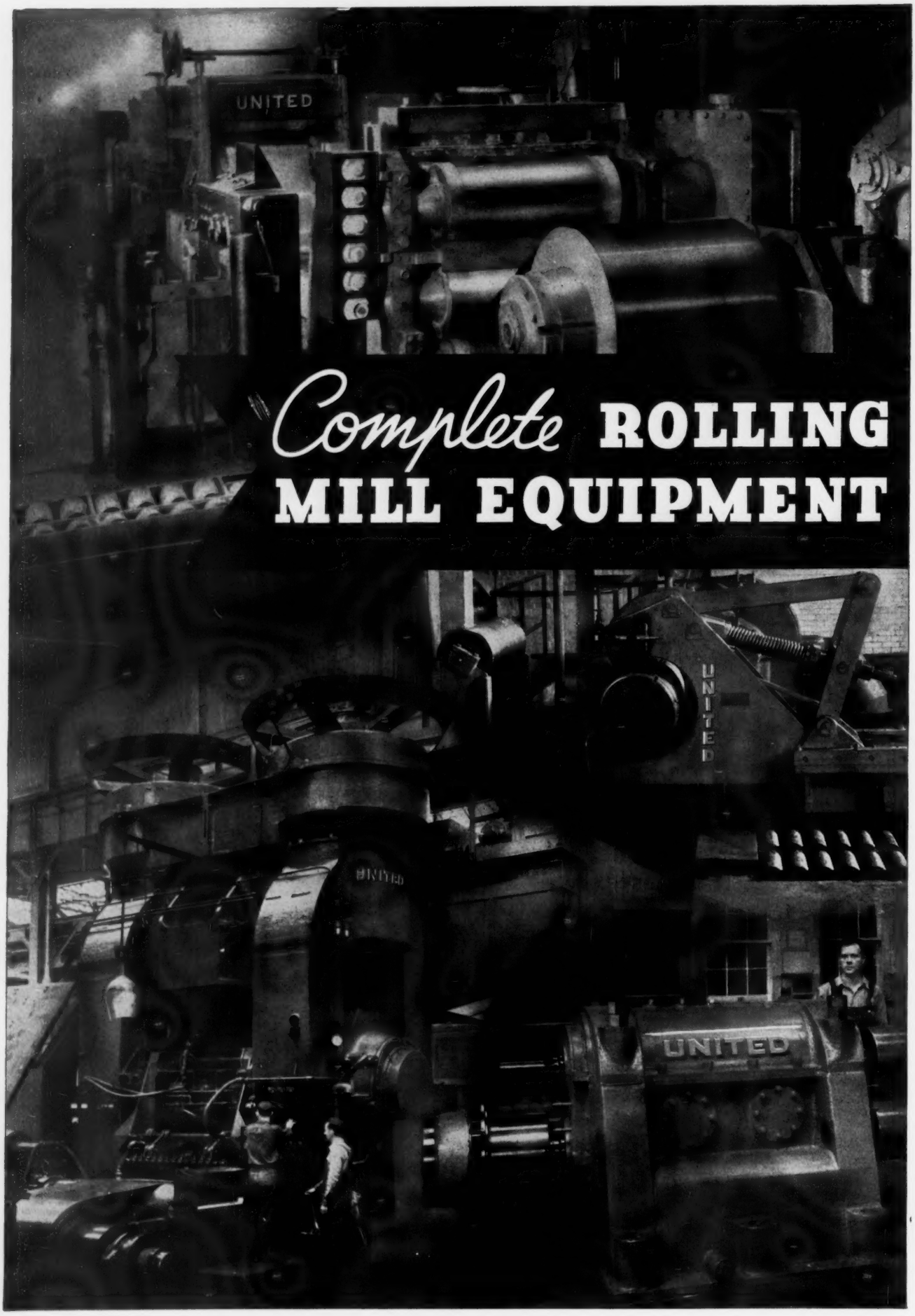
■ Combining steel and Masonite in its construction, a new type chair for industrial seating has been introduced by Royal Metal Mfg. Co., 1138 South Michigan avenue, Chicago.

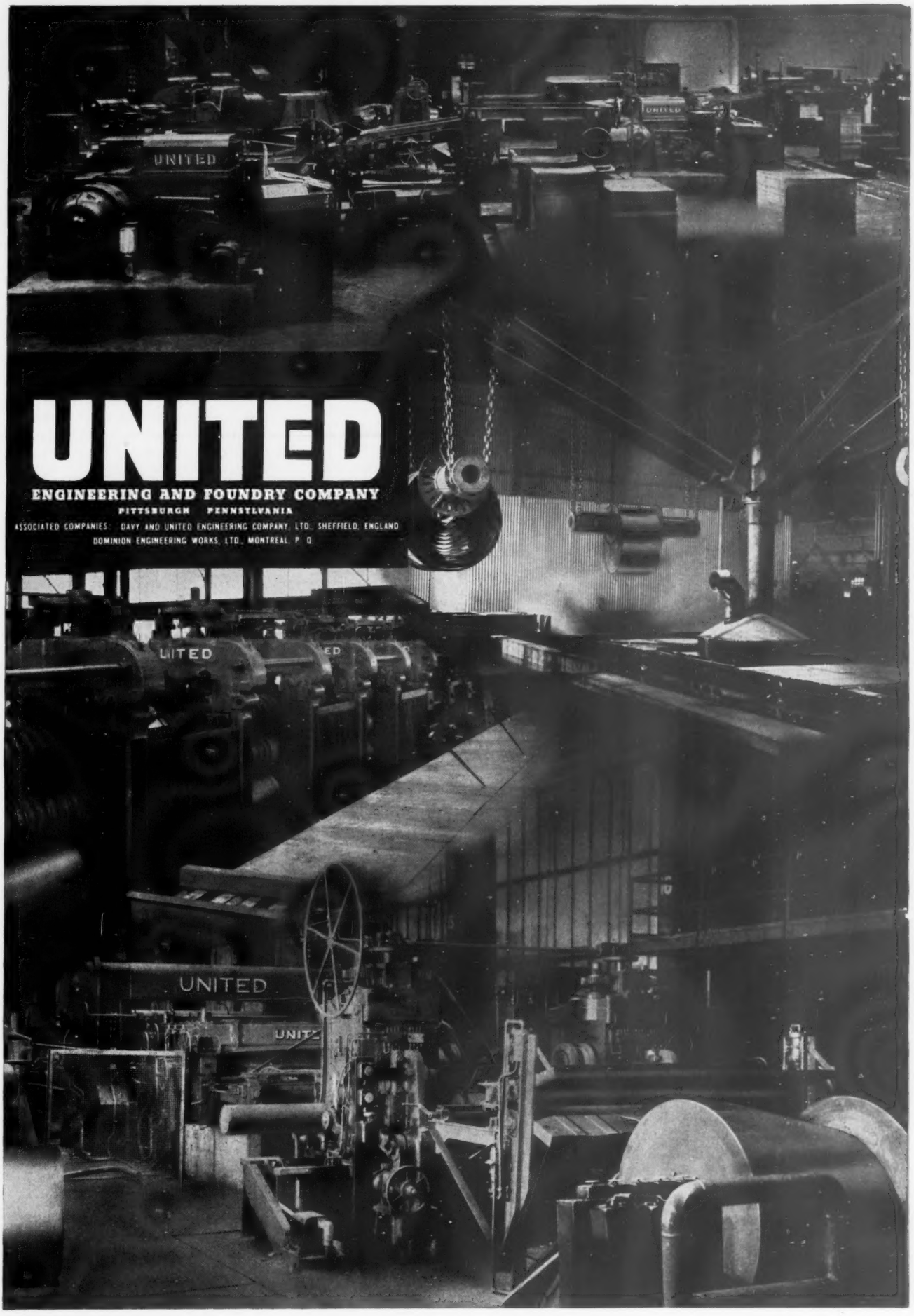
Frame is heavy angle steel, and leg braces are double riveted for extra strength. Seat and curved backrest are Masonite, a non-porous, weatherproof material that resists wear and can be washed frequently. Seat is attached to sturdy steel support, and spring steel back is adjustable for height.

■ Offering increased flexibility to meet changing requirements of modern business, a visible record filing system has been developed by Diebold Safe & Lock Co., Canton, O.

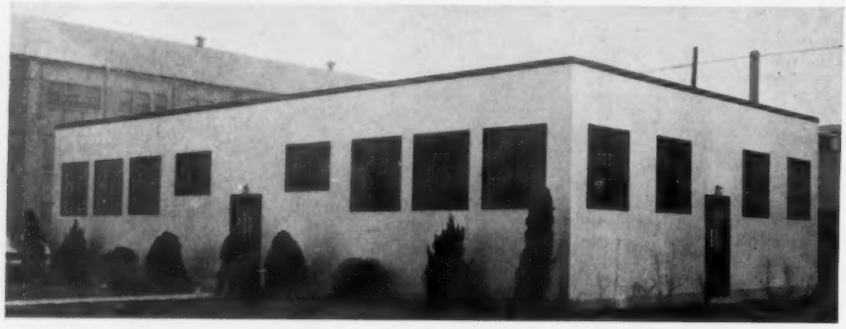
Filing cabinets are formed by stacks of flat drawer sections, fabricated of sheet steel and welded into rigid lightweight units. Each vertical stack of files starts with a steel base attached to bottom of the first section, and one steel top is required for each stack. All drawers, sections, bases and tops are interchangeable and interlock together. Filing systems thus can be expanded to meet requirements by simply adding more steel sections.




UNITED
Complete ROLLING MILL EQUIPMENT
UNITED
UNITED
UNITED


UNITED
UNITED
UNITED
ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH PENNSYLVANIA
ASSOCIATED COMPANIES: DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND
DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q.
UNITED

Builds New Shower-Locker-Wash Units



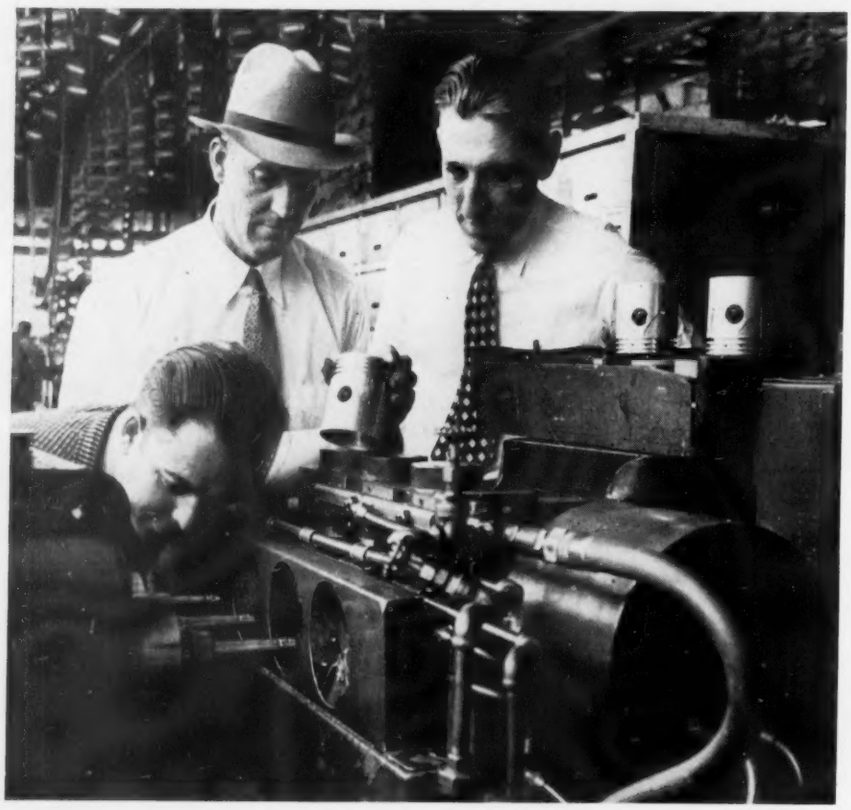
■ This 42 x 68-foot building of Steelox construction is one of several locker and washroom units recently installed at plants of American Rolling Mill Co., Middletown, O. Providing locker accommodations for 450 men and wash fountains and showers for 10 men, the unit shown utilizes stainless steel for partitions, bench coverings, drinking fountains and mirrors. Exterior walls and roof are 18-gage galvanized Paintgrip Steelox sections. Interior walls are 24-gage galvanized panels of the 5-V crimp type.

Lathe Lighting Improved

■ Concentrated local lighting at the point of work on a lathe, supplemented by general floor lighting not less than one tenth of local lighting on the tool, provides best seeing conditions for reducing fatigue and maintaining accuracy, according to experts of Westinghouse Electric Mfg. Co., Pittsburgh.

Good general overhead lighting is sometimes adequate for roughing operations, but not for usual lathe work, and it is uneconomical to increase wattage of overhead fixtures sufficiently to provide intense illumination essential for close work. Concentrated local lighting provides plenty of light on work, but results in eyestrain due to severe contrast with remainder of room. Eyeshock is prevented and work is speeded by lighting which takes a middle course, combining local lighting at point of work with general lighting of not less than one tenth the intensity.

Boring Wristpin Holes



■ Diamond boring of wristpin holes in aluminum pistons for Plymouth engines is accomplished on this recently installed machine, to a tolerance of 0.0002-inch. E. S. Chapman, works manager (center), and Otto Franke, master mechanic (right), watch the operator

Introduces Four New Production Enamels

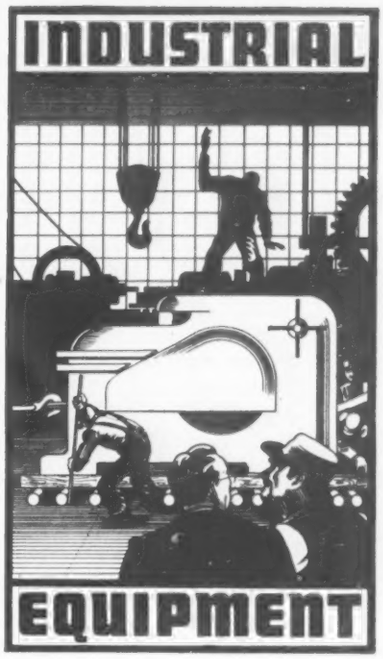
■ A series of four Production Black baking enamels, A-B-C-D, announced by Sherwin-Williams Co., Cleveland, is especially designed as a low-cost finish for such articles as automobile frames, coat hangers, bed springs, steel drums, implements and the like.

Ratings for performance and service have been tabulated to show values developed at baking temperatures of 200, 250, 300, 350 and 400 degrees Fahr. Ratings are charted for gloss, elasticity, adhesion, gasoline resistance, salt spray, bleeding and hardness to enable the user to select the type and procedure best suited to his needs. Type A bakes to a rich gloss, enamel B with a lower gloss and enamel C provides the sharpest gloss. Enamel D is the dull finish of the group. These enamels may be applied equally well by spray, floco or dip methods.

Air Circulation Vital

Air circulation in enamel baking ovens is vital. Much trouble has been caused in some finishing departments through the mistaken attempt to economize on heat by closing some of the vents on the baking ovens. Cases have been known where workmen or subforemen have closed such vents without consulting their superiors causing considerable expense on the part of the management in tracing down the reason for the finishes suddenly coming from the oven in a soft, poor condition.

Location of outdoor exhaust vents has been known to cause ventilation difficulties in some cases. Exhaust vents should always extend well above water tanks, elevator housings and similar obstructions. Cases have been known where outdoor vents were located in such a position that when the wind blew from a certain direction exhaust from the oven was impossible. The use of a dutch helmet on a vertical vent solved the difficulty in each case.



Transformer Permits Individual Lighting

■ American Transformer Co., 178 Emmet street, Newark, N. J., has added to its line a transformer designed to permit individual lighting of electrically operated machines from high-voltage power circuits.

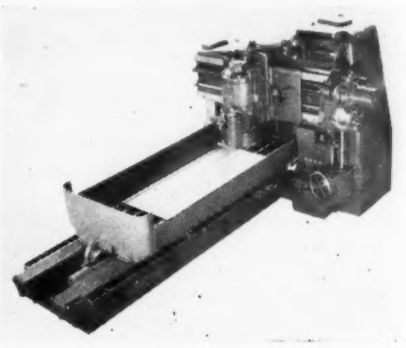
Use of this transformer, known as type UL, eliminates need of separate lighting circuits, drop lights and excessive illumination and obviates necessity of using lamps of one voltage rating throughout a plant. Transformer is mounted on a machine as an integral part and has its input terminals connected to high-voltage power circuit at the motor disconnecting switch. Low voltage for lamps is then available at output receptacle of transformer.

Units are available for use where power circuit voltage is 115, 230, 460 or 575 volts and to supply any standard lamp voltage, such as 6, 32, 64 or 115 volts. Standard sizes are rated 75, 150, 225 and 300 watts output.

Has Large Work Table

■ Hanchett Mfg. Co., Big Rapids, Mich., has introduced a vertical spindle planer type surface grinder, which is said to be one of the largest machines of its kind ever constructed for general use.

Machine weighs approximately 85,000 pounds. Its work table measures 50 x 120 inches, with a distance under wheel of 20 inches. Grinding wheel is segmental type and is 18 inches in diameter, 6 inches high and has a 1½-inch face. Wheel head has automatic down feed in increments of 0.002 to 0.003 inch, an

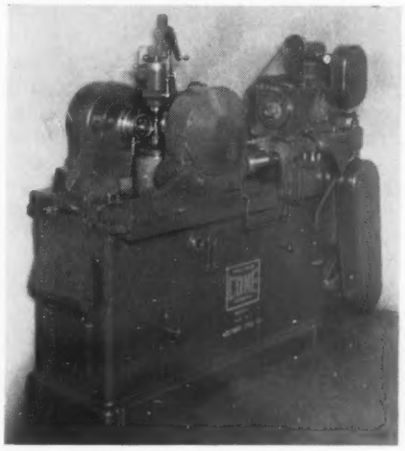


automatic cross feed in steps of ⅛-inch to 5 inches, and a constant cross feed of 30 feet per minute. Grinding wheel is operated at 900 revolutions per minute by a 25-horsepower motor. There are five other individual motors in the machine, for operating hydraulic pump, cross feed, cross rail assembly elevation, coolant pump and forced feed lubrication.

Gear Generator Steps Up Production

■ Michigan Tool Co., 7200 East Six Mile road, Detroit, has developed a line of automatic gear generators for mass production of Cone type area contact worm gearing.

The new machines are designed to handle gearing up to 4-inch center distance, with wheels up to 7-inch diameter and worms up to 3 inches. In the production of Cone worm gearing, both worms and wheels are machined with the generating cutter and work at exact operating center distances, the cutting being handled in two steps. In the roughing operation, a narrow blade cutter is fed into the blank until the required center distance rela-



tion is reached. In finishing, there is a differential rotary feed, which action is made possible by design of the gearing. Teeth are not involute, but are generated of straight lines all tangent to the same base circle about the mating worm or wheel.

Machines for worms and wheels operate identically, hobs being substituted for cutters on cutter spindles, and worms on the work spindle instead of gears. Infeed and rotary-feed mechanisms are operated by an independent ½-horsepower motor.

Pipe Connector Quickly Installed

■ Multi-Seal Mfg. Corp., 123 North Jefferson street, Chicago, has introduced a front drive pipe connector, designed to solve the problem of attaching pipe to tanks and other containers from the outside.

Connector makes it unnecessary to shut down a plant for draining and flushing tanks. It can be installed in five minutes by one operator working from the outside only. Connector is inserted in hole, and, while body is held with a wrench, the action nut is tightened. It is then ready for the line to be connected. This connection may be used for steam, gas, oil, water and air, and will withstand high pressures.

Scleroscope Fits Pocket

■ Shore Instrument & Mfg. Co., Van Wyck avenue and Carll street, Jamaica, N. Y., has developed a pocket size dial indicating scleroscope, so designed that it can be operated as readily as an automatic center punch.

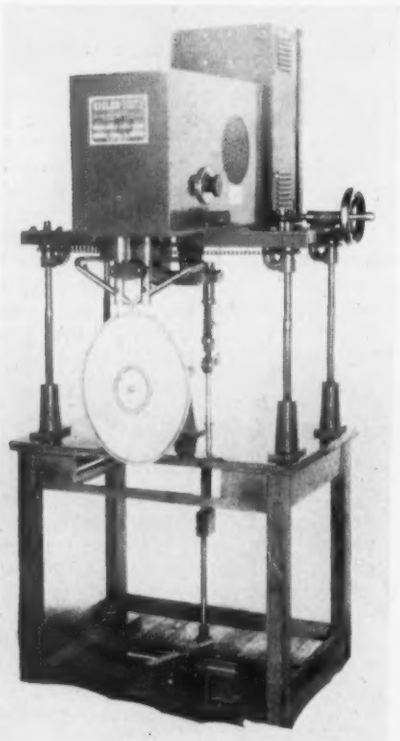
In making hardness tests, instru-

ment is placed on metal object being tested and button on top of barrel is pressed down. Pointer automatically indicates brinell hardness on enclosed scale.

The instrument is only 6 inches long and weighs about a pound. It has a diamond pointed hammer, which is used together with an improved clutch mechanism. With suitable attachments, tests can be made in a bench vise on a surface plate, as well as free-handed.

Spot Welds Gasket Binders

■ Eisler Engineering Co., 762 South Thirteenth street, Newark, N. J., has developed a machine for welding metal binders on asbestos core



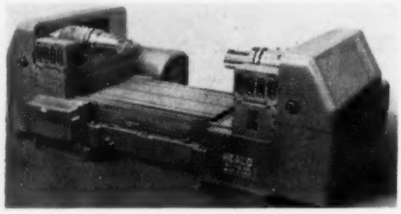
gaskets at rate of about 600 per hour.

Both welding electrodes contact top of the work, preventing gasket from unwinding by electrically welding end of the binding strip to that part of strip directly beneath it in two or three spot welds. Gaskets ranging in size from 4 to 16 inches can be handled by this machine.

Welder illustrated is foot operated, although air operated and motor driven types are available also. Machine is provided with a handwheel for raising or lowering electrodes to approximate welding position. Flow of current during welding is gaged by built-in timer and contactor.

Bores Heavy Machine Tool Units

■ Heald Machine Co., Worcester, Mass., has begun production of a massive precision boring machine,



called No. 45, built especially for boring heavy work such as spindle carriers for screw machines, workheads, driving heads and cutter heads for gear machines.

Unit can be furnished either single or double end, for boring from one end or both ends. Boring heads are mounted on bridge, which has capacity for three to seven heads, depending on size. Heads are V-belt driven at variable speeds by individual direct current motors mounted on sub-bases at rear of machine. Push button control allows boring heads to be placed under automatic control or to be jogged.

The large 36 x 104-inch table has a scraped pad, measuring 28 x 54 inches, with three T-slots for holding fixtures. A hydraulic system drives table on flat and V-ways at a wide range of speeds.

Scale Truck Saves Time

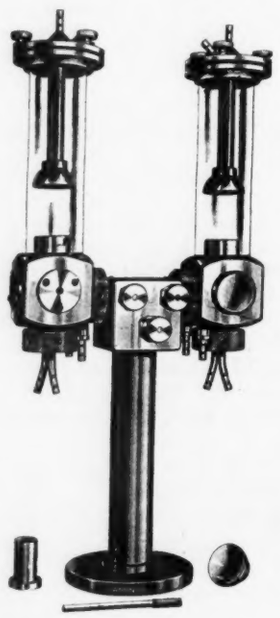
■ Yale & Towne Mfg. Co., Philadelphia, has recently introduced a line of hand lift trucks, featuring a 1000-pound scale truck, designed for weighing small machined parts

in light machinery plants, to determine wage credits.

Truck has an accurate and highly sensitive beam scale, produced by International Business Machines Co. The lift is compounded; a single lift quickly raises load. Ball-bearing, rubber-tired wheels make for easy pull and floor protection, and absorb jars that otherwise would reach scale mechanism. Simplified operation and increased accuracy of this truck save time and improve production flow.

X-Ray Tube Has Unique Valve Construction

■ American Instrument Co., Silver Spring, Md., has developed an ion type X-ray tube for use as a source of homogeneous or heterogeneous X-radiation for diffraction and crys-



tal structure study, metallurgy and chemical analysis.

This tube was developed at the geophysical laboratory of the Carnegie Institution, Washington, and is available in single and double-tube units. Each tube is provided with three windows. Thus three or six radiographs are obtainable independently or simultaneously with single or double units respectively. Each tube can be operated independently at any angle, and in the double unit one tube may be operated while other tube is demounted.

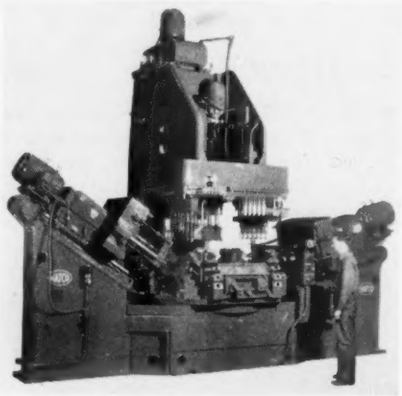
Tubes have stainless steel bodies and pyrex glass cylinders, preventing leakage and corrosion. Vacuum seals and valve construction are unique, and regulation of gas pressure is accomplished conveniently

and precisely. A powder spectrum camera has been designed especially and is offered for use with the new tube.

Cylinder Head Driller Has Many Operations

■ National Automatic Tool Co., Richmond, Ind., has recently built another driller and tapper for automotive cylinder head work, which drills, counterbores, chamfers and taps the six spark plug holes, spotfaces the six intake and exhaust holes, and drills and taps two small holes in the end of a cast iron head.

One operator loads, unloads and operates this machine, maintaining a production rate of 90 cylinder heads per hour. Vertical spindle box of the machine contains twelve spindles with nose adjustment and six tapping spindles with individual lead screws and tap holders. Tapping spindles are driven by an auxiliary reversing motor drive mounted on the top face of the box. Three drilling units are arranged with spindle boxes containing a total of fourteen spindles of similar construction. Horizontal tapping unit is complete with reversing motor



drive and a box containing two individual lead screw tapping spindles.

Mounted on the steel pedestal is a 44-inch diameter four-position automatic hydraulically indexed rotating table on which, in turn, is mounted a four-position fixture arranged to hold one cylinder head in each position.

Replaces Bushings

■ McGill Mfg. Co., 777 Oak street, Valparaiso, Ind., has completed design of a needle bearing intended to fill need of machine tool builders for a greater capacity bearing that would permit replacement of conventional bronze or babbitt bushing. These bearings are SAE 52100 steel hardened throughout and ground to comparable SAE precision ball bearing tolerances. Uniform close tolerances permit substitution for bushings or ordinary ball bearings without a great amount of change in surrounding machine parts.

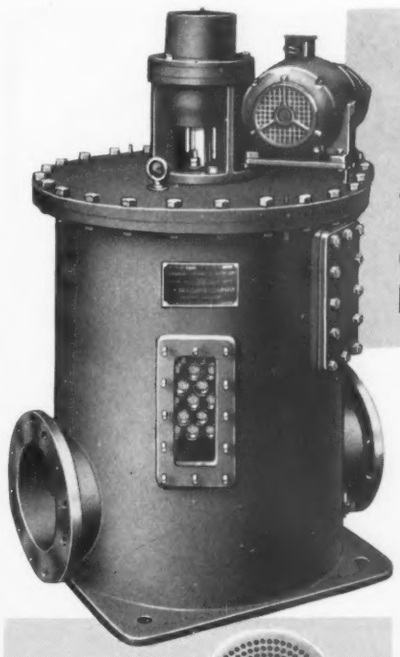
All race sections have greater than average thickness, which, coupled with small diameter rollers to give greater race contact and heavy rigid end washers, insures larger capacity and longer bearing life.

Bearing is offered in three types: complete unit, inner race and roller assembly, or outer race and roller assembly. Shaft sizes are from ⅝ inch to 6⅞ inches.

Compressor Has Large Air Capacity

■ Electric Sprayit Co., 220 North Broadway, Milwaukee, has introduced a compressor and paint spraying unit, known as the Sprayit series 300, which produces a spraying pressure of over 30 pounds.

Piston-type compressor has aluminum alloy piston and connecting



BRASSERT
Self-Cleaning
STRAINER

IN addition to a variety of steel works uses, including the removal of dirt from spray water for rolling, this strainer is now being successfully used for... **removal of Coke from the Hot Drain Liquors at By Product Coke Plants**

For Particulars Address

H. A. BRASSERT and COMPANY

310 South Michigan Avenue
CHICAGO, ILLINOIS

436 Seventh Avenue
PITTSBURGH, PENNA.

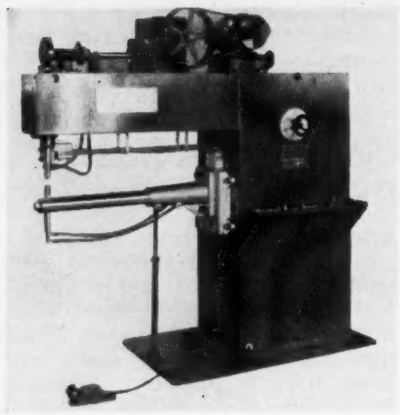
rod, and runs smoothly, without pulsations. Its displacement of 2.58 cubic feet of free air per minute results in a finer breakup, faster performance and a better paint finish. Special oil and moisture filter eliminates contamination of air. Compressor therefore may be utilized for all types of air pressure service or as a vacuum pump. Power unit is ¼-horsepower motor with V-belt drive.

Spray gun furnished with this compressor is of the pressure feed, internal breakup type, and is fully adjustable. Gun is capable of delivering atomized spray from 6 to 8 inches wide, permitting a coverage of from 700 to 1200 square feet per hour.

Welder Is Adaptable

■ Eisler Engineering Co., 762 South Thirteenth street, Newark, N. J., has placed on the market a new spot welder, characterized by its wide adaptability.

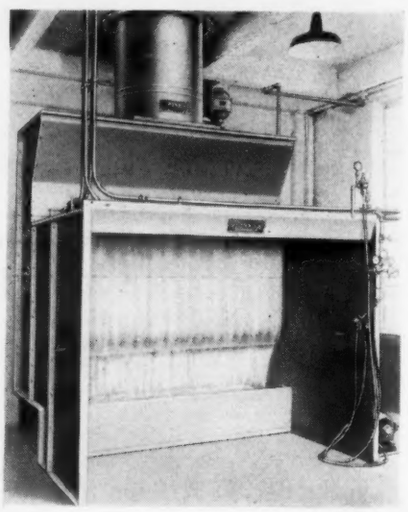
Except for driving arrangement, the welding mechanism of this machine is completely enclosed in a fabricated box type frame. The ¾-horsepower variable-speed drive and safety clutch permit a range of from 20 to 150 strokes of the upper electrode per minute. Operation of upper electrode is straight up and down, with a stroke of 1½ inches, although any desired stroke may be built into the machine to specification. Mounted on same camshaft as the overhead driving cam is an additional cam which acts as a timer in regulating current dwell. Even though this cam is adjustable, an automatic timer is supplied with the contactor for more sensitive control.



Throat depth of the machine is 36 inches, but any other depth between 12 and 48 inches may be had. The lower electrode is adjustable both horizontally and vertically.

Reclaims Paints

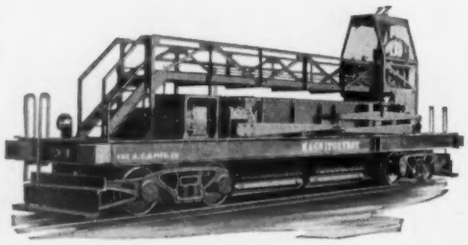
■ Binks Mfg. Co., 3114 Carroll avenue, Chicago, has developed a unit called the Dynaprecipitor, designed to take the place of ordinary water-wash chamber for spray booths.



Using a new principle in cleaning of paint fumes, this unit reclaims all types of paints, synthetic enamel,

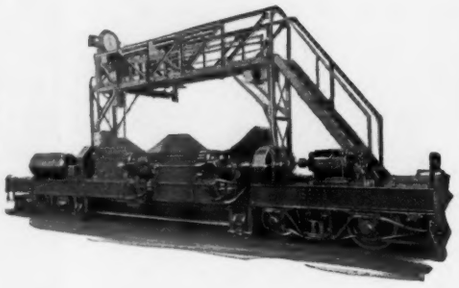
(*Please turn to Page* 61)

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levellers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

ADVERTISING PAGES REMOVED

Spent Pickle Liquor

(*Concluded from Page* 36)

bubble for many minutes when dropped into water and the actual air spaces can be figured from the difference in weight of the brick wet and dry.

For some purposes, this absorption is undesirable and to eliminate this, an object made of the material is treated with silicate of soda (water glass) which reacts chemically to form ferric silicate and at the same time seals the pores. Inasmuch as this treatment affects only the surface and not the interior, the high insulating value is maintained.

Because of its high insulation, low cost, and fireproof qualities, the material can be made into wall board. It can be produced in sheets of any desired size and thickness. Claim is made that it insulates as well as any of the organic wall boards but will not burn at any temperature and will not warp. Nails can be driven into it and will hold.

Ferron and 85 per cent magnesia are said to have about the same insulating value, but the former is stronger and will insulate at a higher temperature (900 degrees Fahr. in place of 600 degrees) without losing its strength. The material can be painted and finished in many ways to give pleasing effects and to waterproof it. One of the potential fields, therefore, is pipe covering.

Can Be Sprayed On

Building block of light weight and high insulating value can be made by mixing the material with cement, sand, lime and other building materials. Large blocks of the material can be cut into bricks by means of gang saws. Ferron also is made in the form of light flour which can be mixed with water and sprayed on boiler settings and other places where fireproof insulation is required.

This flour, or a specially-sized nodule, which will not pack, can be blown in between house walls or placed in under eaves. Besides insulating houses, it is stated that the material also acts as a fireproofing material as it liberates a certain amount of chemically combined water when heat is applied. Should a house so insulated catch fire, the material would discharge water vapor to retard progress of the flames. In the form of blocks or slabs, the material offers possibilities in insulating stoves and other articles from heat losses where temperatures do not exceed 900 degrees Fahr.

In plastic form, Ferron mixes well with clay in all proportions and if incorporated before the clay is fired, it lightens the resulting product by filling it with microscopic air spaces.

Being largely a porous ferric hydroxide and calcium sulphate, the material has possible uses in the chemical industry. For example, it removes hydrogen sulphide and other sulphur compounds from gases and liquids. It is a good material to remove hydrogen sulphide from manufactured gas. Silver kept in boxes or on slabs made of Ferron will not tarnish, it is said. It provides a good filtering mass for many operations. Tests now being conducted indicate that the material can be used agriculturally as a soil conditioner and secondary fertilizer.

Industrial Equipment

(*Concluded from Page* 58)

vitreous enamel, etc. It gives 99 per cent elimination of paint pigments from spray fumes. Unit is equipped with a special set of precipitator plates which are self-cleaning. An outstanding feature is the water curtain which extends full width of spray booth. Paint pigments which strike this curtain are washed down into collecting pan.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

FOR WAREHOUSING

- An inexpensive installation and an economic method of unloading, storing and recovering of steel sheets, bars, and shapes.
- A two ton job — hand propelled four runway crane and carrier with rope controlled electric hoist.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

Making Bolts

(*Continued from Page 38*)

ing handled. The conveyor automatically dumps the heated work in a soluble oil quench and an auxiliary conveyor carries the work out of the quench bath and into metal tote boxes from which the bolts are packed into containers.

The nut forming machines also make use of a hoist operating on a runway over the stock feeding reels. These machines utilize standard, horizontal, pinwheel-type reels, the coils being placed on these reels directly from the overhead hoist.

In addition to the lower cost of handling materials and saving in floor space this new materials handling system makes it possible to store a much larger quantity of material, thus permitting increasing stock on hand during a period of rising prices. This method also enables close control of cleaning, coating and drawing of the hot-rolled raw material and makes it possible to take advantage of a saving in cost on these operations. These savings of course are in addition to those accruing from reduced handling costs, larger storage capacity and reduced space required.

Thus it is evident that the installation of this pickling and liming department and materials handling system will be a large factor in decreasing production costs.

♦

Exhaust System Code For Foundry Use

■ *Tentative Recommended Good Practice Code and Handbook on the Fundamentals of Design, Construction, Operation and Maintenance of Exhaust Systems,* by industrial hygiene committee of American Foundrymen's association, Chicago, 150 pages, 35 charts; supplied by STEEL, Cleveland, for $4; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Two other codes have been issued previously in a series for the control and abatement of occupational diseases. The previous codes were on grinding, polishing and buffing sanitation and on testing and measuring air flow in exhaust systems. Each of these has gone to a second edition and costs $1 each.

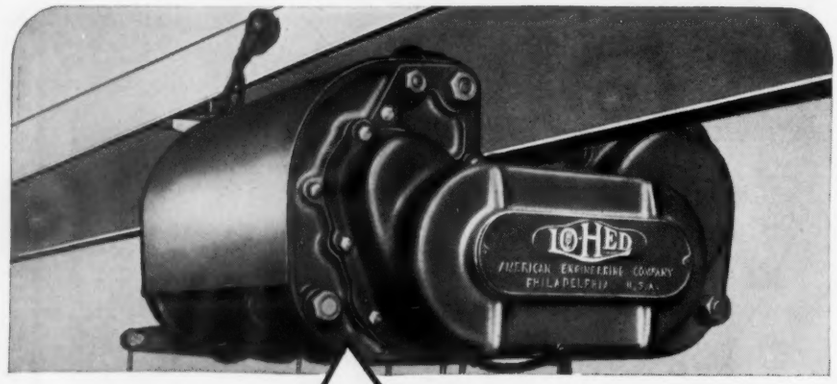
The new code gives complete engineering information essential to proper design and construction of exhaust systems and is of importance to small as well as large foundries. It serves as a guide to companies too small to have an engineering organization.

Research in preparing this work developed entirely new information and data are included on resistance losses or friction in straight pipes and elbows. The appendix gives an example of an exhaust system completely worked out, showing use of the rules and formulas in the text. Among the subjects treated are: Theory of air flow, applications of exhaust systems, factors affecting flow of air, application of collection equipment, air flow producing equipment, designing and calculating, provisions for make-up air, general construction specifications, industrial vacuum cleaning equipment, operating, supervision and maintenance.

Pipe Union Withstands Vibration

■ Designed for use in oil fields or wherever pipe lines are subject to high pressure or vibration, a new malleable iron pipe union has been developed by Red-Rex Corp., Houston, Tex.

This union is leakproof, highly resistant to corrosion, non-porous, and allows for expansion and contraction caused by temperature changes. It may be installed easily and tightened by action of a single screw. Each union is tested to 8000 pounds, providing a 5000-pound margin of safety over normal working pressures.



A High Factor of Safety Here

Assures Safer Handling Here

Specify *THE* hoist with the highest factor of safety!

Let the nearest A-E-CO representative show you why A-E-CO Lo-Hed HOISTS are the safest hoists built.

Ask him to explain Lo-Hed's exclusive features that mean constant, dependable performance and lower maintenance cost.

Let him show you Lo-Hed's uses in scores of industries.

Find out *why* Lo-Hed is the logical hoist for EVERY purpose and why it is the *only* hoist for low headroom conditions. A-E-CO Lo-Hed HOISTS are built in many standard models, from ¼ to 12 ton capacities.

Classified phone directories list the local A-E-CO representative in principal cities. Call him in... or write us for the new hoist catalog.

Other A-E-CO Products: Taylor Stoker Units, Marine Deck Auxiliaries, Hele-Shaw Fluid Power

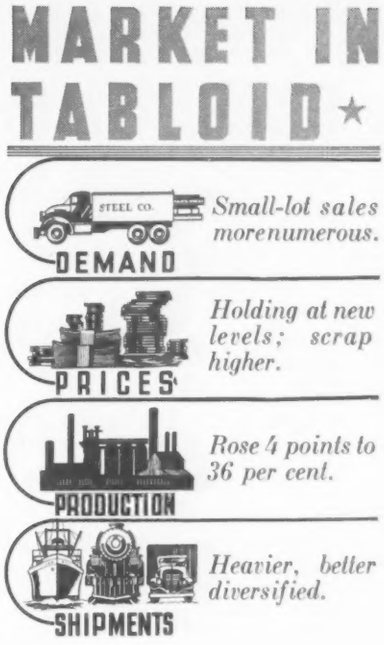
A-E-CO Lo-Hed HOIST

AMERICAN ENGINEERING COMPANY

2484 ARAMINGO AVENUE, PHILADELPHIA, PA.

Demand Gains Slowly, Lags Behind Output

Operations Advance To Year's High; Scrap Rises



■ TANGIBLE evidence of recovery in steel buying is appearing but at a less rapid pace than is indicated by the improvement in sentiment and in raw steel production.

The industry has high hopes that the recent spurt in activity will be furthered during the balance of the year, although subsequent betterment in operations undoubtedly will be unable to match that of the past two weeks, when ingot output was stepped up 50 per cent.

Production rose an additional 4 points last week to 36 per cent, equal to the rate reached in the first week of April, highest this year. Since the July 4 holiday the rate has advanced 12 points.

The increase last week more than compensated for the improvement that has occurred in rolled steel demand and is accounted for partly by the necessity for mills to bolster their stocks of semifinished material.

Steel producers permitted their inventories of semifinished products to decline during the first half, resulting in only scant supplies of certain analyses lately. The moderate pickup in finished steel sales, consequently, dictated an increase in semifinished production. In the interest of economy some mills are producing a larger quantity of ingots than required immediately, hence recent gains in operations have run ahead of the expansion in consumption.

Encouraging to producers is the diversification of recent orders. A sprinkling of purchases by automotive accounts for final runs on 1938 models, however, has moderated for the time being as the period for the changeover to 1939 editions is being entered. Little support to steel buying will be provided by motor interests until this work is completed.

Reflecting automotive plant shutdowns, assemblies last week totaled 32,070 units, a decline of nearly 10,000 from the week before. General Motors curtailed from 17,900 units to 13,415; Ford was steady at 12,500; Chrysler reduced from 6190 units to 2750; while all others cut from 5420 to 3405.

Production of material for the building of 5550 freight cars for the Southern railway has been an important factor in boosting steelmaking at Chicago and Birmingham. Chicago operations gained 1.5 points to 34 per cent last week, while the southern district was 8 points higher at 50 per cent. Gains predominated changes elsewhere, with Pittsburgh up 2 points to 27 per cent, Wheeling up 6 points to 51 per cent, Youngstown up 5 points to 35, eastern Pennsylvania up 0.5 to 28, New England up 5 to 40 and Cincinnati up 12 to 50 per cent. Production was unchanged at four centers—Buffalo at 35, Cleveland at 26, Detroit at 29 and St. Louis at 18.

Railroads are marking time in the purchase of material and equipment, and little domestic business in freight cars and locomotives is in immediate prospect. Building and heavy engineering projects are productive of fair tonnages, and this steel outlet shortly gives promise of being swelled by PWA spending.

Navy department will take bids Oct. 5 on three battleships, requiring an estimated 50,000 tons of rolled steel.

Much of the uncertainty earlier this month as to prices has been removed, although the lower quotations now in effect have failed to persuade most consumers to order steel beyond early needs. However, clarification of prices has resulted in some balancing of stocks of users and warehouses and has helped to promote a fairly large number of small purchases.

Pig iron buying has subsided, following active coverage of third quarter requirements recently when price reductions were accompanied by unconfirmed rumors that part of the cuts would be revoked in August. Pig iron shipments against contracts are slow to increase, reflecting light operations among most foundries. Inquiries for castings are reported heavier in some districts.

Scrap prices continue to forecast gains in steel production, the market being strong in all directions and rising further in a number of areas last week. Increases at Chicago and eastern Pennsylvania boosted the scrap composite 42 cents to $13.50, highest since February. The iron and steel composite was advanced 3 cents by the rise in scrap to $36.30. The finished steel composite was unchanged at $57.20.

COMPOSITE MARKET AVERAGES

	July 23	July 16	July 9	One Month Ago June, 1938	Three Months Ago April, 1938	One Year Ago July, 1937	Five Years Ago July, 1933
Iron and Steel	$36.30	$36.27	$36.33	$38.41	$38.61	$40.03	$29.67
Finished Steel	57.20	57.20	57.20	61.55	61.70	61.70	47.20
Steelworks Scrap..	13.50	13.08	12.50	10.89	12.30	18.51	10.66

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	July 23, 1938	June 1938	April 1938	July 1937
Steel bars, Pittsburgh	2.25c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.25	2.40	2.50	2.50
Steel bars, Philadelphia	2.57	2.47	2.765	2.74
Iron bars, Terre Haute, Ind.	2.15	2.35	2.35	2.35
Shapes, Pittsburgh	2.10	2.25	2.25	2.25
Shapes, Philadelphia	2.215	2.403	2.465	2.455
Shapes, Chicago	2.10	2.25	2.30	2.30
Plates, Pittsburgh	2.10	2.25	2.25	2.25
Plates, Philadelphia	2.15	2.445	2.445	2.435
Plates, Chicago	2.10	2.25	2.30	2.30
Sheets, hot rolled, Pittsburgh	2.15	2.40	2.40	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.45	3.45	3.55
Sheets, No. 24, galv., Pittsburgh	3.50	3.75	3.80	3.80
Sheets, hot rolled, Chicago	2.15	2.40	2.50	2.50
Sheets, cold-rolled, Chicago	3.20	3.20	3.25	3.25
Sheets, No. 24, galv., Gary	3.50	3.80	3.90	3.90
Bright bess., basic wire, Pitts.	2.60	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.25	$5.35	$5.35
Wire nails, Pittsburgh	2.45	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	37.00	37.00	37.00
Rerolling billets, Pittsburgh	34.00	37.00	37.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	47.00	47.00	47.00

Pig Iron

	July 23, 1938	June 1938	April 1938	July 1937
Bessemer, del. Pittsburgh	$21.34	$25.34	$25.30	$25.26
Basic, Valley	19.50	23.50	23.50	23.50
Basic, eastern, del., Philadelphia	21.34	24.69	25.34	25.26
No. 2 foundry, Pittsburgh	21.21	25.21	25.21	25.21
No. 2 foundry, Chicago	20.00	24.00	24.00	24.00
Southern No. 2, Birmingham	16.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	19.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	22.215	25.465	26.215	26.135
Malleable Valley	20.00	24.00	24.00	24.00
Malleable, Chicago	20.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	30.34	30.34	30.04
Gray forge, del Pittsburgh	20.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	97.77	107.77	107.77	107.29

Scrap

Heavy melting steel, Pittsburgh	$14.25	$11.40	$12.70	$19.40
Heavy melt. steel, No. 2, E. Pa.	12.75	9.875	11.55	16.55
Heavy melting steel, Chicago	12.75	10.25	11.45	17.75
Rails for rolling, Chicago	17.25	14.90	15.25	20.30
Railroad steel specialties, Chicago	15.25	13.50	13.75	20.20

Coke

Connellsville, furnace, ovens	$3.75	$3.90	$4.25	$4.50
Connellsville, foundry, ovens	5.00	5.05	5.25	5.30
Chicago, by-product foundry, del.	10.50	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Gary	2.15c
Chicago, delivered	2.18c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown	2.15c
Youngstown	2.15c
Pacific Coast points	2.75c

Cold Rolled

Pittsburgh	3.20c
Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown	3.20c
Youngstown	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Gary	3.50c
Chicago, delivered	3.53c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown	3.50c
Youngstown	3.50c
Pacific Coast points	4.10c

Tin Mill Black No. 29

Pittsburgh	3.30c
Gary	3.40c
Granite City, Ill.	3.50c

Long Ternes No. 24 Unassorted

Pittsburgh	3.95c
Gary	3.95c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown	2.75c	3.35c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.70c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.39c
Pacific Coast points	2.70c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Mfg. terne plate, Pittsburgh	4.65c
Gary	4.75c
Granite City	4.85c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c

Iron

Terre Haute, Ind.	2.15c
Chicago	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt.	2.05c
Gulf ports	2.40c
Pacific coast ports, f.o.b. car docks	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.90c
Gulf ports	2.25c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Pitts.-Cleve.-Chgo., 100 lb. keg	
Standard wire nails	$2.45
Cement coated nails	$2.45

(Per pound)

Polished staples	3.15c
Galv. fence staples	3.40c
Barbed wire, galv.	3.20c
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts.-Cleve.-Chicago

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c
Worcester, Mass., $2 higher on bright basic and spring wire.	
Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.70c
Chicago	2.70c
Gary, Ind.	2.70c
Detroit	2.75c
Cleveland	2.70c
Buffalo	2.70c

Subject to quantity deductions and extras.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.80c
Detroit, delivered 2.90c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring flats 0.15
6100 bars 1.20
6100 spring flats 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40
Electric furnace up 50 cents.

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23⅛-in. Pittsburgh, Chicago, Gary, Cleveland Youngstown, Middletown Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Pittsburgh, Chicago	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass., $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Angle bars, billet, mills	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Car axles forged, Pitts., Chgo., B'ham.	3.15c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off

Stove Bolts

In packages with nuts attached 70-5 off; in packages with nuts separate 70-10-5 off; in bulk 80-5 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off

Plow Bolts

All sizes	65-5-5 off

Nuts

Semifinished hex.; ½-in. and smaller	60-10-5 off
Do., ⅝ to 1-inch	60-5-5 off
Do., over 1-inch	60-5 off

Hexagon Cap Screws

Milled	50-10-5 off
Upset, 1-in. smaller	70-5-5-off

Square Head Set Screws

Upset, 1-in., smaller	80-5-5 off
Headless set screws	75-5 off

Rivets, Washers

Structural, Pittsburgh, Cleveland	3.40c
Structural, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Philadelphia	36.50
Duluth	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Forging, Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	34.00

Wire Rods

Pitts., Cleveland, Chicago, Bham., No. 5 to ⅜-inch, incl.	43.00
Do., over ⅜ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$26.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$21.00	$21.50	$20.50	$22.00
Birdsboro, Pa.	21.00	21.50	20.50	22.00
Birmingham, Ala.‡	16.38	.....	15.38	21.00
Buffalo	20.00	20.50	19.00	21.00
Chicago	20.00	20.00	19.50	20.50
Cleveland	20.00	20.00	19.50	20.50
Detroit	20.00	20.00	19.50	20.50
Duluth	20.50	20.50	.....	21.00
Erie, Pa.	20.00	20.50	19.50	21.00
Everett, Mass.	21.75	22.25	21.25	22.75
Granite City, Ill.	20.00	20.00	19.50	20.50
Hamilton, O.	20.00	20.00	19.50	.....
Neville Island, Pa.	20.00	20.00	19.50	20.50
Provo, Utah	18.00	.....	.....	.....
Sharpsville, Pa.	20.00	20.00	19.50	20.50
Sparrow's Point, Md.	21.00	.....	20.50	.....
Swedeland, Pa.	21.00	21.50	20.50	22.00
Toledo, O.	20.00	20.00	19.50	20.50
Youngstown, O.	20.00	20.00	19.50	20.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	21.39	21.39	20.89	21.89
Baltimore from Birmingham	21.78	.....	20.66	.....
Boston from Birmingham	21.87	.....	.....	.....
Boston from Everett, Mass.	22.25	22.75	21.75	23.25
Boston from Buffalo	22.25	22.75	21.75	23.25
Brooklyn, N. Y., from Bethlehem	23.50	24.00	.....	.....
Canton, O., from Cleveland	21.39	21.39	20.89	21.89
Chicago from Birmingham	†20.22	.....	.....	.....
Cincinnati from Hamilton, O.	20.44	21.11	20.78	.....
Cincinnati from Birmingham	20.06	.....	19.06	.....
Cleveland from Birmingham	20.32	.....	19.82	.....
Mansfield, O., from Toledo, O.	21.94	21.94	21.44	21.44
Milwaukee from Chicago	21.10	21.10	20.60	21.10
Muskegon, Mich., from Chicago, Toledo or Detroit	23.19	23.19	22.69	23.69
Newark, N. J., from Birmingham	22.15	.....	.....	.....
Newark, N. J., from Bethlehem	22.53	23.03	.....	.....
Philadelphia from Birmingham	21.46	.....	20.96	.....
Philadelphia from Swedeland, Pa.	21.84	22.34	21.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	22.45	22.45	21.95	21.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.55	20.55	20.05	.....
St. Louis from Birmingham	†20.12	.....	19.82	.....
St. Paul from Duluth	22.08	22.08	.....	22.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $25.50, Phil. base, standard and copper bearing, $26.63.

Gray Forge		Charcoal	
Valley furnace	$19.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	19.50	do., del. Chicago	28.34
		Lyles, Tenn	23.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $24.50; 6.51-7—$25.00; 7-7.50—$25.50; 7.51-8—$26.00; 8-8.50—$26.50; 8.51-9—$27.00; 9-9.50—$27.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $92.50
Do., del. Pittsburgh 97.49

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., New Orleans 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 97.75
2% carbon 102.75 1%, 112.75
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do., less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.80
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, freight allowed lb. 4.75c
Ton lots 5.25c
Less-ton lots 5.50c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.76
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.40
Philadelphia	3.85	3.85	4.35	3.65	3.65	5.25	3.65	...	4.50
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	....	4.40
Pittsburgh	3.50	3.40	3.40	3.45	3.45	5.05	3.40	....	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.68
Detroit	3.68	3.83	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	4.00	4.00	3.80	3.83	5.43	3.75	....	4.78
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.40	4.40	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.01	4.16	4.16	3.96	3.96	5.71	3.91	....	5.26
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	....	5.15
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	4.20	....	5.25
Seattle	4.45	4.50	5.85	4.15	4.15	5.90	4.30	....	5.60
Portland, Oreg.	4.30	4.70	6.10	4.15	4.15	5.90	4.30	6.50	5.25
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	3.95	3.95	5.45	4.10	6.40	5.25

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	SAE Cold Drawn Bars: 3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	9.25	8.69	7.29
Philadelphia	3.66	4.36	4.10	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	....	....	..	.	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	8.65	8.25	6.85
Pittsburgh	....	3.95	3.75	7.35	5.95	8.20	8.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	4.10	3.83	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.75	8.25	6.85
Minneapolis	....	4.58	4.00	7.60	6.20	8.73	9.28	8.88	7.48
Milwaukee	....	4.18	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.85	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	..	4.90		....	....	....	....	....	....
Tulsa, Okla.	....	5.09	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.98	....	....	....	....	....	....	....
New Orleans	5.00	5.10	.	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	.	.
Los Angeles	4.45	6.60	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, July 21

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons: **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.06 5 10 0	$15.77	1 19 0
Basic bessemer	....	17.99	2 4 6
Hematite, Phos. .03-.05	31.98 6 10 0*	.....	.....
Billets	$38.75 7 17 6	$34.36	4 5 0
Wire rods, No. 5 gage	55.47 11 5 6	$41.43	5 2 6
Standard rails	$49.82 10 2 6	$46.48	5 15 0
Merchant bars	2.42c 11 0 0	1.93c	5 5 0
Structural shapes	2.34c 10 12 6	1.78c	4 17 6
Plates, ¼ in. or 5 mm.	2.54c 11 11 3	2.24c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.86c 13 0 0	2.66c	7 5 0°
Sheets, gal., 24 ga., corr.	3.69c 16 15 0	3.20c	8 15 0
Bands and strips	2.92c 13 5 0	2.01c	5 10 0
Plain wire, base	4.29c 19 10 0	2.24c to 2.66c	6 2 6 to 7 5 0
Galvanized wire, base	5.11c 23 5 0	2.87c to 2.97c	7 17 6 to 8 2 6
Wire nails, base	4.07c 18 10 0	2.56c to 2.74c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.98 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$26.81	5 9 0(a)	$16.50	598	$14.87	440	$25.31 63
Basic bess. pig iron	24.60	5 0 0(a)	.....	...	.....	...	27.92 (b) 69.50
Furnace coke	7.38	1 10 0	5.66	205	7.27	215	7.63 19
Billets	38.75	7 17 6	23.18	840	29.07	860	38.76 96.50
Standard rails	2.23c	10 2 6	1.50c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.68c	12 4 0††	1.40c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.43c	11 0 6††	1.37c	1,055	1.65c	1,100	1.93c 107
Plates, ¼-in. or 5 mm.	2.58c	11 14 3††	1.76c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.47c	15 15 0§	2.08c	1,600‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.07c	18 10 0	2.93c	2,250	4.13c	2,750	6.66c 370
Plain wire	4.29c	19 10 0	2.16c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.85c	12 19 0††	1.57c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 66.4 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	12.00
Bos. dock No. 1 exp.	11.00-11.50
New Eng. del. No. 1	11.00
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	10.75-11.25
Chicago, No. 2 auto	10.25-10.75
Cincinnati, dealers	9.00- 9.50
Cleveland, No. 1	11.50-12.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.75-10.00
Eastern Pa., No. 1	14.00-14.25
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	10.75-11.25
Granite City, R. R.	11.50-12.00
Granite City, No. 2	9.50-10.00
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
N. Y. dock No. 1 exp.	†11.50
Pitts., No. 1 (R. R.)	15.00-15.50
Pittsburgh, No. 1	14.00-14.50
Pittsburgh, No. 2	12.00-12.50
St. Louis, R. R.	11.00-11.50
St. Louis, No. 2	10.25-10.75
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dirs. No. 1	8.00
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo	10.50-11.00
Chicago, factory	11.00-11.50
Chicago, dealer	10.00-10.50
Cleveland	11.00-11.50
Detroit	10.50-11.00
E. Pa., new mat.	14.00-14.25
E. Pa., old mat.	10.00-10.50
Los Angeles	12.50-13.00
Pittsburgh	14.00-14.50
St. Louis	7.00- 7.50
Valleys	11.50-12.00
Cincinnati, del	8.50- 9.00

BUNDLED SHEETS

Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	10.00-10.50
Cleveland	7.00- 7.50
Los Angeles	11.00-11.50
Pittsburgh	12.00-12.50
St. Louis	5.50- 6.00
Toronto, dealers	5.00

SHEET CLIPPINGS, LOOSE

Chicago	8.25- 8.75
Cincinnati, dealers	4.50- 5.00
Detroit	7.00-7.50
†Los Angeles	3.75- 4.00
St. Louis	5.00- 5.50

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	11.00-11.75
Cincin., No. 1, deal.	6.50- 7.00
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	5.75- 6.25
Detroit, No. 1, new.	8.50- 9.00
Valleys, new, No. 1.	10.00-10.50
Toronto, dealers	5.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.25- 3.75
Cleveland	4.75- 5.25
Detroit	5.50- 6.00
Eastern Pa.	8.00
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	7.75- 8.25
St. Louis	2.75- 3.00
Toronto, dealers	5.00
Valleys	7.00- 7.50

SHOVELING TURNINGS

Buffalo	8.00- 8.50
Cleveland	5.00- 5.50
Chicago	6.50- 7.00
Detroit	6.50- 7.00
Pittsburgh	7.25- 8.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	6.50- 7.00
Cincinnati, dealers	2.50- 3.00
Cleveland	5.75- 6.25
Eastern Pa.	6.00- 6.50
Detroit	5.50- 6.00
New York	†2.00- 2.50
Pittsburgh	7.00- 7.50
Toronto, dealers	5.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	11.00-11.50
Eastern Pa.	10.00-10.50
St. Louis	8.00- 8.50
Toronto	6.00

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem.	†5.00
Bos. dist. for mills	†6.00
Buffalo	6.50- 7.00
Chicago	6.00- 6.50
Cincinnati, dealers	2.50- 3.00
Cleveland	5.75- 6.25
Detroit	5.50- 6.00
E. Pa., chemical	10.00-11.00
New York	†3.00- 3.50
St. Louis	2.00- 2.50
Toronto, dealers	5.50

RAILROAD SPECIALTIES

Chicago	15.00-15.50

ANGLE BARS—STEEL

Chicago	14.25-14.75
St. Louis	12.50-13.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.50-16.00
Chicago, leaf	14.50-15.00
Eastern Pa.	16.50-17.00
Pittsburgh	16.00-16.50
St. Louis	13.00-13.50

STEEL RAILS, SHORT

Birmingham	14.00
Buffalo	17.00-17.50
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.50-16.00
Cincinnati, dealers	16.25-16.75
Detroit	14.00-14.50
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	16.00-16.50
St. Louis, 2 ft. & less	13.00-13.50

STEEL RAILS, SCRAP

Boston district	†9.50
Buffalo	16.00-16.50
Chicago	13.00-13.50
Cleveland	15.00-16.00
Pittsburgh	15.50-16.00
St. Louis	11.50-12.00
Seattle	16.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	13.00-13.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	8.00- 8.50
Cincinnati, dealers	6.00- 6.50
Eastern Pa.	12.00-12.50
New York	†8.00- 8.50
St. Louis	7.50- 8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.50-10.00
Chicago, No. 1 net	8.50- 9.00
Eastern Pa., No. 1	14.50-15.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	11.00-11.50
Toronto, No. 1 dlr.	14.00

FORGE FLASHINGS

Boston district	†6.50
Buffalo	11.00-11.50
Cleveland	8.50- 9.00
Detroit	7.25- 7.75
Los Angeles	9.00
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston district	†6.25
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	16.00-16.50
Eastern Pa., crops	16.50-17.00
Pittsburgh, crops	17.00-17.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa.	17.00-17.50
Pitts. (light & hvy.)	14.50-15.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Chicago	17.00-17.50
New York	†13.50-14.00
Eastern Pa.	16.00-16.50
St. Louis	14.25-14.75

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.50-17.00
Boston district	†15.00
Chicago, net	17.00-17.50
Eastern Pa.	21.50-22.50
St. Louis	16.00-16.50

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	12.00-12.50

SHAFTING

Boston district	†14.25
New York	†15.00-15.50
Eastern Pa.	19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.50
Buffalo, steel	16.50-17.00
Chicago, iron	13.25-13.50
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	14.00-14.50
Eastern Pa., iron	15.50-16.00
Eastern Pa., steel	16.50-17.00
Pittsburgh, iron	14.50-15.00
Pittsburgh, steel	16.00-16.50
St. Louis, iron	11.50-12.00
St. Louis, steel	12.50-13.00

NO. 1 CAST SCRAP

Birmingham	13.00-13.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	10.00-10.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto net	12.00-12.50
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	10.75-11.25
Cleveland, mach. net	15.00-16.00
Eastern Pa., cupola	16.00-16.50
E. Pa., mixed yard	13.50-14.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	14.50-15.00
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	9.50-10.00
St. L., No. 1, mach.	12.25-12.75
St. Louis, agr. mach,	11.25-11.75
Toronto, No. 1, mach., net	10.50

HEAVY CAST

Boston dist. break	†10.00
New England, del.	10.50-11.00
Buffalo, break.	11.00-11.50
Cleveland, break. net	13.00-13.50
Detroit, break.	9.00- 9.50
Detroit, auto net	11.00-11.50
Eastern Pa.	15.00-15.50
Los Ang., auto, net.	13.00-13.50
New York, break.	†10.50-11.00
Pittsburgh, break	12.50-13.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†7.50- 8.00
Buffalo	12.00-12.50
Chicago, net	9.50-10.00
Cincinnati, dealers	5.75- 6.25
Detroit, net	8.50- 9.00
Eastern Pa.	12.50-13.00
New York, fdry	†9.00
St. Louis	6.75- 7.25
Toronto, dealers, net	7.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	13.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. deal.	10.25-10.75
Cleveland, rail	13.25-13.75
Eastern Pa., R. R.	15.00-15.50
Los Angeles	17.50-18.00
Pittsburgh, rail	14.00-14.50
St. Louis, R. R.	11.00-11.50

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty pd.	nom. $18.00-19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	nom. 35.00
so. African,, 50-52%	nom. 35.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 64

Pittsburgh—Sheet production and demand have risen above early July levels. While automotive sources account for little business, miscellaneous buyers are placing larger tonnages. Customers are not concerned over possibility of lower prices, and some jobbers are seeking contracts guaranteeing current quotations on all third quarter deliveries. Production of common and full finished sheets has risen to about 35 per cent, while galvanized output is up 10 points to over 40 per cent, highest since November. Increasing demand from jobbers in anticipation of the fall rebuilding and reroofing season is given as one reason for better activity in galvanized material. Manufacturing consumers are taking galvanized at an unchanged rate.

Cleveland — Any marked upturn in sheet buying is expected to be deferred until August, when renewed demand from the automotive industry is looked for. Low stocks of most consumers are expected to aid future business, but current needs in some instances are affected adversely by inventory-taking and vacation shutdowns. Sheet mill operations have risen slightly, due primarily to some small releases from auto builders in completing runs on 1938 models.

Chicago—With automotive buying still light, sheet business has shared only slightly in recent gains in finish-steel sales. Farm implement builders continue to take material at a fairly good rate. Automotive sheet buying lately has been principally for final run on present models and for trial work on 1939 models.

New York — What slight changes are noted in sheet demand are upward. Galvanized business, roofing in particular, has broadened, while some manufacturing consumers are taking in more tonnage to balance inventories. Jobbers, however, show little interest, and while their stocks are well below normal, there is little tendency to increase purchases pending the appearance of a better movement of sheets out of store.

Philadelphia—While some small releases of sheets have been issued by a local autobody builder to try out dies for 1939 models, substantial shipments are not expected for a month or six weeks. Miscellaneous business is somewhat better but is not in the volume anticipated. Few releases have appeared from oil burner makers.

Buffalo — Sheet sales are slightly heavier despite indisposition of jobbers and consumers to add extensively to stocks. The leading producer, recently operating one and two days a week, is putting into effect a triple turn, four days a week, at least for the remainder of July.

Cincinnati—Little effect is apparent on sheet demand here as the result of recent revision in prices. Orders are well sustained and business is from a wide source, with a number of automobile manufacturers in the market lately. A temporary lull in motor car steel buying is looked for during the immediate future.

St. Louis — Sheet deliveries are steady, but new business is quiet. Price reductions have given little stimulus to demand. Manufacturing consumers are taking only sufficient galvanized sheets for early needs and purchases for the building industry are slow to broaden. Enameling stock is moving in fair volume, mainly to the refrigeration and stove industries.

Birmingham, Ala. — Renewed inquiry for sheets has been evident over the past few weeks, with galvanized in particular demand. Orders for replenishment of stocks have increased, especially during the past week, and a general stepping up of production is predicted.

Strip

Strip Prices, Page 65

Pittsburgh — Strip demand, although a trifle higher, still is light, with principal consumers placing only small orders. Automotive buying is slow and less active than orders from miscellaneous users. Hot strip production is around 25 per cent, with cold strip output slightly lower.

Cleveland — With strip producers able to give early delivery, consumers are reluctant to buy for future needs despite availability of lower prices. Sales and production are a shade higher, but the start of any substantial gain in activity is expected to be postponed until August. Seasonal influences are restricting operations of some strip consumers this month.

Buffalo — Strip buying has increased slightly, largely for immediate needs of consumers and warehouses. Orders from stamping companies have gained a trifle, but little betterment in demand is attributed to the automotive industry. Sellers look for a decided pick-up in business around the middle of next month.

New York — While buying of narrow cold strip still is spotty and largely for inventory adjustment, demand has shown a further slight improvement. Some pickup in specifications has occurred from the textile industry, and a few automotive accessory manufacturers show more interest. Makers of household equipment and domestic hardware are more optimistic but have not increased their releases to any extent.

Birmingham, Ala. — Some improvement in demand has been noted, but the bulk of volume is not expected until next month, with shipments of cotton ties.

Plates

Plate Prices, Page 64

Pittsburgh — Plates are more active and have been an important factor in the recent rise in operations here. A large share of plate bookings represents public construction projects in various sections of the country. A substantial tonnage of plates is included in the 2200 tons of fabricated steel for spillway gates and trash racks for the Chickamauga dam, Tennessee. This material will be furnished by the Dravo Corp., Pittsburgh.

Cleveland — Plate sellers report orders received so far this month are behind the comparable June period. Little improvement is anticipated the remainder of July, but most sellers look for better activity early in August. Outstanding recent railroad inquiry includes five freight locomotives for the Wheeling & Lake Erie railroad.

New York — Tank fabricators anticipate steady improvements in PWA work, but the outlook for railroad requirements continues poor. Following the recent release of the Southern railway car requirements, prospective business includes only quarterly needs of railroads which were held up originally by the general reduction in steel prices at the close of last quarter. Plate specifications for ship work are steady but little new tonnage has been awarded recently.

Amtorg Trading Corp., New York, has placed 3200 tons of plates with Bethlehem Steel Co. for thirteen 80,000-barrel tanks for shipments to Russia. Plates for European export have been reduced to 1.80c, f.a.s., in line with a recent reduction by the European cartel.

Philadelphia — Navy department will take bids Oct. 5 on battleships, 57, 58 and 59, requiring an estimated 50,000 tons of plates, shapes and bars. Specifications are due shortly. Preliminary releases have been made against steel for the C-2 boats awarded eastern yards by the mari-

time commission, but total tonnages may be slow in coming out. Some small lots also are being placed for ship repairs.

Birmingham, Ala. — The plate market surged upward this week with the placing of a $1,000,000 order by the Southern Railway for 2000 box cars, and 20,000 tons of steel products will be needed. Other scattered orders are holding up, and a much larger volume is expected when railroad purchases become more general.

San Francisco — Plate awards were confined to small lots of less than 100 tons and no new inquiries of size developed. To date this year 17,042 tons have been placed as compared with 29,442 tons for the corresponding period in 1937.

Seattle — Award is pending at Vancouver, B. C., for furnishing 3000 tons of electric welded steel water pipe. Vancouver Iron Works Ltd. appears low at $399,341.

Plate Contracts Placed

2600 tons, hull steel, for four navy destroyers, two to Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and two to Bath Iron Works Corp., Bath, Me.

1500 tons, ten tanks for Union Oil Co., Portland, Ore., two 86,000-bbl., three 42,000-bbl., one 37,000-bbl. and four 18,000-bbl. tanks, to Steel Tank & Pipe Co. of Oregon, Portland, Oreg.

220 tons, tanks, Aurora Gasoline Co., Detroit, to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

3000 tons, 32, 48 and 60-inch electric welded water pipe for Vancouver, B. C.; Vancouver Iron Works, Ltd., Vancouver, apparently low.

Bars

Bar Prices, Page 64

Pittsburgh—Merchant bar orders are moderately heavier. Demand is well scattered, of small individual purchases. Jobbers are taking larger lots, the recent price reduction inducing warehouses to release some orders previously deferred. Automotive buying is light, consisting of small lots for trial work on new models. Bar mill operations, while slightly above the average for the year to date, held below the peak of earlier in the year.

Cleveland — Commercial and alloy steel bar sales have been slightly heavier lately. Orders are well diversified, but being small individually remain relatively light in the aggregate. Farm equipment manufacturers are taking larger lots, apparently to balance stocks, since immediate needs are rather small. Automotive buying is quieter following a brief spurt in connection with final runs on current models. Jobber purchases indicate no extensive additions to stocks but are heavier than before recent price reductions.

Chicago — Commercial and alloy steel bar demand remains slow. Automotive needs are slight, but farm equipment requirements hold at a fair rate. A marked improvement is looked for when work starts on 1939 automotive models and when heavier operations are resumed by implement and tractor plants, though this is not in prospect before next month.

New York—While bar sellers report little or no increase in business since the recent price reduction, better demand is in prospect in some directions. Roller bearing manufacturers are expected in the market shortly in anticipation of heavier automotive needs, and machinery builders, reporting some pickup in orders, also may be more active. Government arsenal specifications recently have been lighter than usual.

Philadelphia—Further slight improvement has appeared in merchant bar specifications, with alloy grades moving relatively better than carbon material. Eastern railroads are out of the market, even for routine needs, but requirements of miscellaneous users give the market somewhat better activity.

Buffalo—Demand for commercial and alloy steel bars is holding at the recently improved level, although little change is attributed to the new price basing system. Automotive demand shows little change, buying for new models having yet to appear.

Birmingham, Ala. — Added to the recent upturn in spot demand for bars, has come the Southern Railway's $1,000,000 box car order, and the Tennessee company's bessemer plant is expected to speed production of bars for the 2000 cars.

Pipe

Pipe Prices, Page 65

Pittsburgh — Minor fluctuations in demand for line pipe and for oil country tubular products about balance, resulting in little change in total bookings. It is too early to determine all of the effects of the new marketing set-up in the oil fields. Some work still is going on in adjusting prices of a number of minor grades of tubular products.

Cleveland — Jobbers report no improvement in miscellaneous requirements for industrial repairs and extensions. In a few instances tonnage booked so far this month has fallen behind June. Outstanding pending projects include approximately 500 tons for a new water distribution system at Mentor, O. A number of other small municipalities are planning similar projects. Private work requiring either cast or steel pipe remains at a low ebb.

Chicago — Cast iron pipe demand is slightly heavier, from diversified sources. United States Pipe & Foundry Co. is low bidder on 489 tons of pipe for Chicago, principally 30 and 42-inch pipe. Lynchburg Foundry Co. has been awarded 202 tons for a WPA project at Springfield, Ill.

New York — Pipe jobbers with stocks on consignment are participating more freely in resale business, due to recent reduction in mill prices. However, distributors owning stocks outright are inclined to shade on attractive tonnages. Less work is being figured, but some projects are developing which will lead to substantial buying later this summer. This includes the Metropolitan Life Insurance housing project, taking approximately 1500 tons.

Municipal orders for cast iron pipe have slumped and buying generally is quiet. Culvert pipe, 12 to 60-inch, continues to be released by the treasury procurement division for the $25,000,000 New Jersey road building program inaugurated recently.

Several thousand tons of steel pipe of various diameters will be required in connection with the Delaware aqueduct project, which is up for bids July 20.

San Francisco — Demand for cast iron pipe is being delayed, awaiting PWA funds. American Cast Iron Pipe Co. took 156 tons of 6 and 8-inch pipe for Santa Monica, Calif. The treasury department, San Francisco, will take bids July 26 for 128 tons of 6-inch pipe. Awards totaled only 309 tons and brought the aggregate for the year to 18,029 tons, compared with 18,269 tons for the same period a year ago.

Seattle — Immediate demand is slow, no large projects being up for figures. Many communities in the Pacific Northwest are planning system extensions and improvements as soon as federal funds are allocated. Disposal plant projects at Seattle and Ellensburg, Wash., will require limited tonnages of cast pipe. Ephrata, Wash., has voted a bond issue to match a $93,387 PWA grant, Parker & Hill, Seattle, engineers.

Cast Pipe Placed

275 tons, 6-inch for Spokane, Wash., to

Pacific States Cast Iron Pipe Co., Provo, Utah.

Steel Pipe Placed

1000 tons, 2 to 8-inch, welded gas line, Buzzard Bay Gas Co., Falmouth, Chatham and Hyannis, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

Cast Pipe Pending

150 tons, 8 and 12-inch for Spokane, Wash.; bids July 28.

Wire

Wire Prices, Page 65

Pittsburgh—Both manufacturers' wire and merchant wire products are slightly more active despite unwillingness of most warehouses to add materially to stocks. While inventories are light, availability of early delivery is inducing jobbers to withhold orders until their business is improved. Manufacturers' wire is moving better to some consumers who have shown an appreciable gain in requirements lately. Automotive buying is expected shortly.

Cleveland — Orders for wire and wire productions continue slow, some producers predicting July booking will be less than June despite new low prices. Business in fencing and other merchant items from farm districts is light, while warehouses generally are not disposed to expand inventories so long as they are ample to meet current needs. Mill operations continue irregular.

Chicago — Improvement in sentiment in this market has exceeded what slight gain has occurred in demand lately. Producers anticipate a decided upturn in business late this quarter, headed by a pick-up in automotive buying next month.

New York — Betterment in wire products buying is spreading. Merchant products, including nails and staples, are more active than was expected, being stimulated by scantiness of purchases earlier in the year. Manufacturers' wire is finding more diversified demand, with a noticeable improvement in specifications from automotive accessory interests.

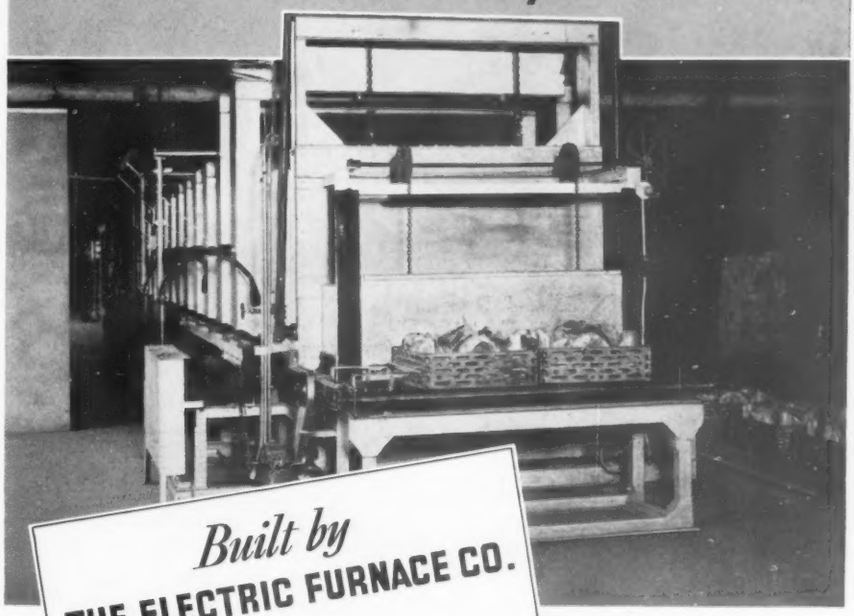
Birmingham, Ala. — Demand for nails, fencing and other wire products has spurted recently, with dealers hastening to replenish stocks. A continued sizable increase in orders is expected.

Cold-Finished

Cold Finished Prices, Page 65

Pittsburgh—Warehouses are adding to stocks of cold-finished bars,

ARMSTRONG'S BRICK
provide efficient insulation for
roller hearth conveyor furnace



Built by
THE ELECTRIC FURNACE CO.
Salem, Ohio

Armstrong's N-16 Insulating Fire Brick play an important part in the high operating efficiency of this furnace, built by The Electric Furnace Company of Salem, Ohio.

LOWER fuel cost, increased operating efficiency, and quicker heating are obtained when furnaces are insulated with Armstrong's Insulating Fire Brick. That's why these efficient brick are the choice of so many leading furnace builders and plant operators.

Low conductivity has been the first consideration in the manufacture of Armstrong's entire line of Insulating Fire Brick. And the high crushing strength of these brick makes them suitable for any type of design without sacrificing thermal efficiency. Armstrong's Brick meet all the essential requirements for practical, efficient insulation. They are available in five types for a wide range of temperatures and uses.

For engineers wishing to make open specifications for high temperature insulation, Armstrong will gladly furnish complete specifications outlining the standard requirements for the different physical characteristics with permissible tolerances. Write today for samples and complete information. Armstrong Cork Products Co., Building Materials Div., 985 Concord St., Lancaster, Pa.

IMPORTANT FEATURES

1. Ample insulating value
2. High crushing strength
3. Accurate sizing
4. High spalling resistance
5. High salvage value
6. Complete line for wide temperature range
7. Ability to withstand handling in shipping and installing
8. Special shapes of all types and sizes
9. Easily cut on the job
10. Stocks available in principal cities
11. Laying cements with same physical characteristics as brick
12. Complete line of refractory facing cements

Armstrong's
HIGH TEMPERATURE INSULATION
INSULATING FIRE BRICK · HIGH TEMPERATURE BLOCK
PLASTIC CEMENTS · DIATOMACEOUS EARTHS

while demand elsewhere is somewhat better. A few orders are coming from the automotive industry, these being apparently for final production of 1938 models and for first trials on 1939 models. Prices are reported firm, with clarification of the new setup complete in practically all instances.

Rails, Cars

Track Material Prices, Page 65

While indications are said to be promising for placing 26 locomotives and 1000 freight cars in this country by the Brazilian Central Railway, domestic demand for railroad rolling stock is light, Wheeling & Lake Erie contemplates the purchase of five freight locomotives. Among the few equipment lists under consideration. Carnegie-Illinois Steel Corp. will purchase nine to 18 sets of trucks for 90-ton drop-end cars.

Gould Coupler Corp. has reopened its plant at Depew, N. Y., to fill an order from the Southern railway for 12,000 couplers. This will keep the plant active for several months.

Order for 125 forty-passenger single-deck motor coaches powered with diesel engines and having automatic hydraulic transmissions, has been received by the Yellow Truck & Coach Mfg. Co., Pontiac, Mich. Fifty will be delivered to New York Omnibus Corp.; 50 to Chicago Motor Coach Co.; and 25 to Fifth Avenue Coach Co., New York. Work on the units is already under way in Pontiac.

Manila Railways has placed its inquiry for 50 box and 50 flat cars and the Boston Elevated Railways has placed 28 coaches.

New York Central will open bids Aug. 2 under the Clayton act for its third quarter steel requirements. Original bids late last month were rejected, due to subsequent in steel prices.

Car Orders Placed

Boston Elevated Railways, 28 coaches to Pullman-Standard Car Mfg. Co., for Worcester, Mass., shops.

Manila Railways, fifty 30-ton box cars Pa., 50 flatcars to Gregg Co. Ltd., to Pressed Steel Car Co., McKees Rocks, New York.

New York Rapid Transit Corp., one streamlined 3-section articulated car of aluminum alloys, to Clark Equipment Co., Buchanan, Mich.

Locomotives Pending

Wheeling & Lake Erie, five freight locomotives, contemplated.

Buses Booked

American Car & Foundry Motors Co., New York, Seven 37-passenger for Florida Motor Lines Corp., Jacksonville, Fla.; five 37-passenger for Boston & Maine Railroad, Boston; five 35-passenger for Virginia Electric & Power Co., Richmond, Va.; four 37-passenger for Maine Central Transportation Co., Portland, Me.; three 37-passenger for Union Bus Co., Jacksonville, Fla.; three 37-passenger for Old Colony Coach Lines Inc., Boston.

Twin Coach Co., Kent, O.: Twelve 31-passenger for Omaha & Council Bluffs Street Railway, Omaha, Nebr.; five 25-passenger for New York State Railways, Utica, N. Y. one 29-passenger for New Haven & Shore Line Railway Co., New London, Conn.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Bolts, nuts and rivets are slightly more active. Jobbers have been the principal buyers lately, with better specifications noted from automotive interests. Railroad purchases have been confined principally to distribution of about 3000 tons of rivets for building of 5550 freight cars for the Southern railway. Building construction needs are steady, but releases still are relatively light. Prices are steadier following recent reductions on bolts, nuts and rivets.

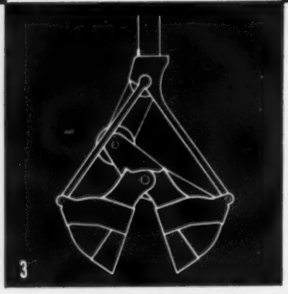
THERE'S A
BLAW-KNOX
BUCKET
FOR EVERY STEEL
PLANT SERVICE

1

1 Granulated B. F. Slag, comparatively easy digging, permitting use of Blaw-Knox POWER WHEEL BUCKETS with large, hardened, slow-moving bearings—principally a maintenance problem.

2

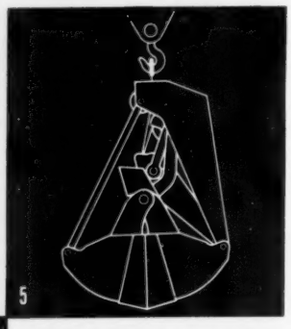
2 Blaw-Knox ORE BUCKETS four-rope type, low height for high storage, anti-friction sheave bearings—exceptional digging qualities developing 1 to 1 ratio or better.


3

3 Blaw-Knox Two Line Buckets for hard digging; built at weights suitable for handling O. H. slag, limestone, Spiegel, Ferro Mang., pig iron. Adaptable to overhead cranes and locomotive cranes.

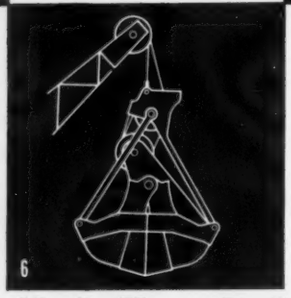
4

4 When "hook-on" operation is necessary, much is gained by using Blaw-Knox 2 line type hook-on buckets. Especially suited to O. H. cinder yard service where 2 hooks are usually available.


5

5 Blaw-Knox Single Line "Hook-On" Buckets. Heavily built for O. H. service and medium weight types for handling roll scale, also for handling clay and other materials in O. H. Ladle House.

6 Blaw-Knox Two Line Buckets for locomotive cranes built at various weights to suit operating requirements including medium weight types adaptable to broad range of service.


6

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2002 FARMERS BANK BUILDING * PITTSBURGH, PA.

Shapes

Structural Shape Prices, Page 64

New York — American Bridge Co., Pittsburgh, is low on 5250 tons, superstructure, for the approach Lincoln tunnel, North Bergen, N. J., for the New York Port authority. This plus the 16,750 tons involved in the Delaware Aqueduct project, two subway projects in Queens involving 7000 tons and the West side highway ramps at Canal street involving 3500 tons insure good business ahead. Leading award involved 2000 tons for the French building, World's fair, New York, placed through James Stewart & Co., New York, with American Bridge Co., Pittsburgh.

Pittsburgh — Public projects will take the bulk of larger structural jobs now pending, although several new private inquiries are up for bids. Among the latter, 1200 tons for plant extensions and improvements for Rotary Electric Steel Co., Detroit, is outstanding. A building addition for Humble Oil Co., Houston, Tex., calls for 1000 tons.

Cleveland — Structural orders from private sources, while limited to small miscellaneous tonnages, are slightly heavier. This situation is reflected in better activity among smaller fabricators. Chesapeake & Ohio railroad has taken bids on 465 tons for a grade crossing at Brighton, O. Bethlehem Steel Co., Bethlehem, booked 788 tons of piling for Fairport, O., harbor improvement. A substantial tonnage involved in state and county projects still pends. Prices are steadier.

Chicago — Fabricated structural steel inquiry is heavier. Larger items are made up of public projects, but there is a fair sprinkling of private work. Bridge inquiries involve about 2500 tons, while a field house at Virginia, Minn., will take 1032 tons. Awards include 1000 tons for a bridge at Bixby, Okla. For a building at Hammond, Ind., for American Steel Foundries, 390 tons has been placed.

Philadelphia — State of Pennsylvania has been allotted grants amounting to $27,000,000 from PWA for 101 construction projects, only two smaller jobs have reached the bidding stage. Additional grant of $50,000,000 is in prospect which means large expenditure for shapes and reinforcing steel. Heavy buying in other eastern states is also expected. Private work is slow.

Buffalo — Shapes are slightly less active, but a large volume of PWA work now being figured enhances the outlook. Few private jobs are pending. The two leading inquiries expected soon are the Kenmore school and the Kleinhans Music Hall, each to cost $1,500,000.

San Francisco — A fair volume of structural awards were placed during the week and aggregated 1815 tons, bringing the total for the year to 69,425 tons compared with 113,709 tons in 1937. Included among the larger lots were 500 tons for a hotel at Albuquerque, New Mexico, taken by American

Shape Awards Compared

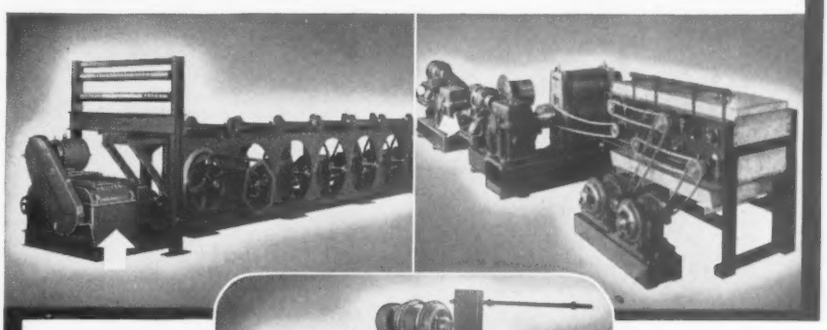
	Tons
Week ended July 23	**16,648**
Week ended July 16	**12,925**
Week ended July 9	**13,606**
This week, 1937	**29,463**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**16,090**
Weekly average, June	**20,758**
Total to date, 1937	**804,622**
Total to date, 1938	**482,709**

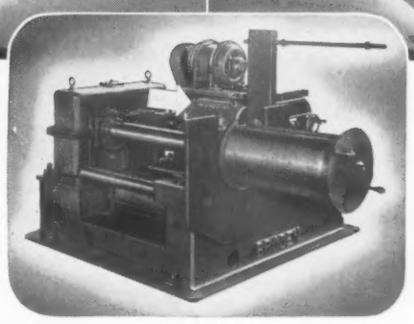
Includes awards of 100 tons or more.

PRODUCING

Stainless Steel

WITH REEVES SPEED CONTROL





ABOVE: *Steel strip is drawn from annealing furnace and coiled on this* REEVES-*regulated patenting frame.*

ABOVE: *Removal from pickling vat and recoiling.*

LEFT: *Final wind-up before forming.*

• Typifying the manner in which the accuracy and positiveness of modern REEVES Speed Control units are rapidly gaining increased recognition and popularity in steel and steel products mills—consider the applications pictured above.

Operating on a. c., with no possibility of unwanted fluctuation from d. c. current drop—due to loads imposed by other equipment—REEVES VARIABLE SPEED TRANSMISSIONS permit quick and accurate changes of speed to be made on all three wire machines in order that different weights and widths of steel strips may be heat-treated, pickled and coiled on drums and spools with new precision, speed and economy. Modern REEVES units are easily applied and easily controlled, automatically or by handwheel. Perhaps you have a production problem that we can help you solve. Write us.

New catalog G-384, just off the press.

REEVES PULLEY COMPANY • *Dept. SL-78* • COLUMBUS, INDIANA

REEVES SPEED CONTROL

Bridge Co., Pittsburgh, and 400 tons for an addition to the Lockheed Aircraft Corp. plant at Burbank, Calif., secured by Consolidated Steel Corp., Los Angeles. New inquiries include 330 tons for an inspection building for the Railway Facilities of the San Francisco-Oakland bridge in Alameda county, California, up for bids on Aug. 3.

Shape Contracts Placed

2200 tons, spillway gates and trash racks, Chickamauga dam, Tennessee, for Tennessee Valley authority, to Dravo Corp., Pittsburgh.

2170 tons, high school for homemaking, Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

2000 tons, French building, Worlds Fair, New York, to American Bridge Co., Pittsburgh; through James Stewart & Co., New York.

1090 tons, factory building, American Viscose Co., Nitro, West Va., to American Bridge Co., Pittsburgh.

1000 tons, bridge over Arkansas river at Bixby, Okla., to Patterson Steel Co., Tulsa and Virginia Bridge & Iron Co., Roanoke, Va.

925 tons, Highland park bridge floor, contract 402-A, Pittsburgh, for Allegheny county, to Reliance Steel Products Co., Pittsburgh.

788 tons, piling, Fairport, O., harbor improvement, to Bethlehem Steel Co., Bethlehem, Pa.

700 tons, bridge over Blue river, for Kansas City Terminal railway, Kansas City, Mo., to Mt. Vernon Bridge Co., Mt. Vernon, O.

668 tons, sheet piling, dam, Parlin, N. J., 308 tons to Bethlehem Steel Co., Bethlehem, Pa. and 360 tons to Carnegie-Illinois Steel Corp., Pittsburgh.

500 tons, hotel, Albuquerque, New Mex., to American Bridge Co., Pittsburgh.

415 tons, high school, Pocatello, Idaho, to Minneapolis-Moline Power Implement Co., Minneapolis.

400 tons, addition to Lockheed Aircraft Corp., Burbank, Calif., to Consolidated Steel Corp., Los Angeles.

400 tons, state highway bridge, project F-4-E, Manchester, Iowa, to Clinton Bridge Works, Clinton, Iowa.

380 tons, truss span, Delta county, Colorado to Midwest Steel & Iron Works Co., Denver, Col.

330 tons, bridge 2272, Lake Village, Ark., to Virginia Bridge Co., Roanoke, Va.

265 tons, reconstruction of bridges on 175th and 185th streets, Bronx, New York, to American Bridge Co., Pittsburgh; through Kinney & Tinnerty, New York.

230 tons, nurses' home, Newton hospital, Newton, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

230 tons, St. Benedicts school, Morris Park, Long Island, to Lehigh Structural Steel Co., Allentown, Pa.

230 tons, bridge, FA-228, Warren county, Kentucky, to Midland Structural Steel Co., Cicero, Ill.

195 tons, theater, Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.

180 tons, state hospital building, Tewksbury, Mass., to Consolidated Iron Works, Malden, Mass.; Steed-Barbour Co., Boston, general contractor.

175 tons, addition to Grand Stand, Santa Anita, Calif., to Columbia Steel Co., San Francisco.

165 tons, state highway bridge FAGH RC-3967, Broome county, New York, to American Bridge Co., Pittsburgh.

160 tons, state bridge Clallam county, Washington, to Pittsburgh-Des Moines Steel Co., Pittsburgh; Marci Bros., Seattle, general contractor.

155 tons, industrial building, La Grange, Ky., to Snead Architectural Iron Works, Louisville, Ky.

145 tons, Indian Neck avenue bridge, Branford, Conn., to American Bridge Co., Pittsburgh; through Marianni Construction Co. a Connecticut contractor.

140 tons, two annealing furnaces, Surface Combustion Corp., New York, to Belmont Iron Works.

135 tons, nurses' home, hospital, Newton, Mass., to Lehigh Structural Steel Co., Allentown, Pa.; Turner Construction Co., Boston, general contractor.

132 tons, highway project, control 94-2-1, Tarrant county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; also includes 67 tons of reinforcing bars.

125 tons, state highway bridge, RC-3956, Cattaraugus county, New York, to Buffalo Structural Steel Corp., Buffalo.

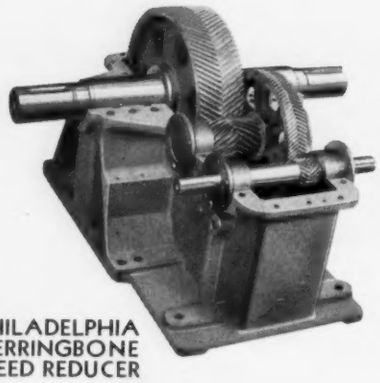
120 tons, boiler shelter, Riley Stoker Corp., Houston, Texas, to Frank M. Weaver & Co., Lansdale, Pa.

115 tons, Roth subway, project 1436, Chicago, Milwaukee, St. Paul & Pacific railroad, Riton, Wis., to Duffin Iron Co., Chicago.

115 tons, bridge, ME-118-251, Mercer county, Ohio, to Burger Iron Co., Akron, O.

115 tons, school, Peru, N. Y., to Vermont Structural Steel Corp., Burlington, Vt., through Stone Bros. Building Co.,

When you choose a Speed Reducer ---- take a look INSIDE



PHILADELPHIA HERRINGBONE SPEED REDUCER

Rugged, sturdy housings are essential . . . BUT, it's what's on the inside that really counts.

Proper designing is the basic requirement, while materials and parts must be chosen by their proven ability to do a job . . . not just to meet a price.

Examine the Philadelphia Double Reduction Herringbone Unit shown above.

Gears are of highest grade manganese alloy steel castings, properly heat treated, with teeth cut to split-hair accuracy and meshing perfectly. *High Speed Shaft and Intermediate Shaft* are of heat treated high carbon Chrome Nickel Steel, mounted on roller bearings. *Output shaft* is a high carbon forging, heat treated and mounted on bronze bearings. Adequate lubrication is continually supplied to all parts.

If you want long life high efficiency with low operating costs . . . then you want a Philadelphia Unit. Remember, we make all types—so let one of our engineers recommend the unit that will best fill your needs.

PHILADELPHIA FOR ALL TYPES OF Speed Reducers

Philadelphia Gear Works

Industrial Gears and Speed Reducers

Erie Avenue and "G" Street

PHILADELPHIA

Troy, N. Y., general contractor.
100 tons, new commercial building, Anthony Carlin, to Burger Iron Co., Akron, O.

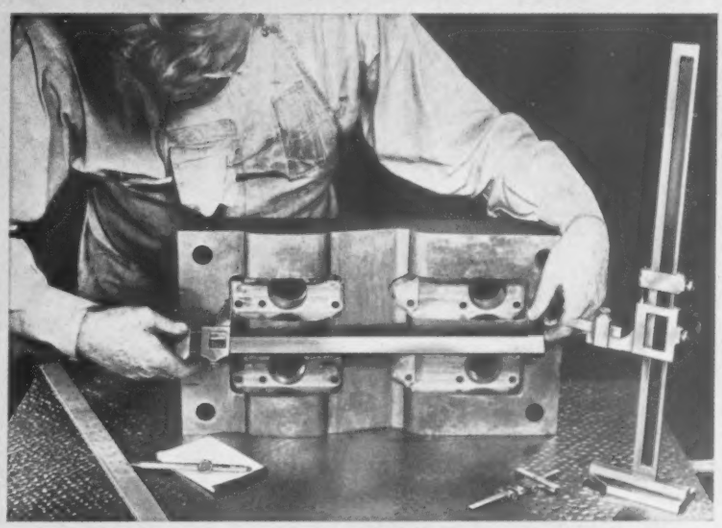
Shape Contracts Pending

5250 tons, superstructure, approach Lincoln tunnel, North Bergen, N. J., for New York Port authority; American Bridge Co., Pittsburgh, low.
1200 tons, Timken Technical high school, Canton, O.; Gibbons Grabler, Canton, low.
1200 tons, field house, Virginia, Minn.
1200 tons, new melt shop and alterations, Rotary Electric Co., Detroit.
1000 tons, addition to building, Humble Oil Co., Houston, Tex.
865 tons, bridge, Cufaula, Okla.
750 tons, Southern Pacific railroad bridge, Los Angeles.
590 tons, foundry shop, Puget Sound navy yard; Midland Steel Co., Cicero, Ill., low.
480 tons, bridge 3204, Pond Creek, Okla., for Chicago, Rock Island & Pacific railway.
450 tons, Washington state highway bridges; bids in at Olympia, July 19.
450 tons, Whittier school, board of education, Pittsburgh.
400 tons, armory, Manchester, N. H.; D. A. Sullivan & Sons, Northampton, Mass., low on general contract, $352,291, bids July 20.
400 tons, Florida building, Worlds Fair, New York; bids in.
330 tons, Inspection building of Railway Facilities of San Francisco-Oakland bridge; bids Aug. 3.
325 tons, bridge, Bowling Green, Ky.
315 tons, state office building, Concord, N. H.; E. J. Pinney Co., Springfield, Mass., general contractor; Lyons Iron Works, Manchester, N. H., low on structural steel.
300 tons, state highway bridges, FAP-773, Griswold, Iowa.
260 tons, state highway bridge 5792, Eveleth, Minn.
255 tons, state highway bridge, project B-1 of 23-6-11, C-1, Lansing, Mich.
250 tons, two bridges, Matanuska, Alaska, for Interior department; Duffin Iron Co., Chicago, low.
250 tons, screening plant pockets, Milwaukee Western Fuel Co., Milwaukee.
205 tons, bridge, Odair, Okla.
200 tons, crossing over Western Pacific tracks, Wolfe Creek, Plumas county, California, for state; bids Aug. 3.
200 tons, addition to Lakewood hospital, Cleveland; bids Aug. 1.
200 tons, two warehouses, specification 1097-D, bureau of reclamation, Green Mountain dam and Estes Park, Colorado.
195 tons, various state highway bridges, bids July 29 to department of highways, Harrisburg, Pa.
175 tons, substructure, Chickamauga power house, Tennessee Valley authority.
170 tons, swing bridge, Rehoboth, Del.; bids Aug. 10.
150 tons, addition, Chapman Valve Mfg. Co., Indian Orchard, Mass.; Stone & Webster Co., Boston, engineers and contractors.
150 tons, sinter crushing plant, American Smelting & Refining Co., Helena, Mont.
150 tons, auditorium, Boston university, Boston.
140 tons, residence, R. K. Mellon, Ligonier, Pa.
140 tons, state highway bridge, Jefferson county, Pennsylvania.
138 tons, Santa Ynez river bridge, Santa Barbara county, California, for state; bids opened.
128 tons, bridge, Jefferson county, Pennsylvania; bids in.
125 tons, residence, Alfred G. Vanderbilt, Worthington Valley, Md.
125 tons, cleaning building and foundry addition, Farrel-Birmingham Co., Ansonia, Conn.
125 tons, building 9-B, Aluminum Co. of America, New Kensington, Pa.
115 tons, bridge near Walden, Jackson county, Colorado; bids July 27.
100 tons, bridge, Sullivan county, Pennsylvania; bids July 29.
100 tons, garage, Boston elevated railroad, Everett, Mass.
Unstated, Oregon state bridge Coos County; bids at Portland Aug. 4.
Unstated tonnage, apartment, bureau yards docks, Annapolis; bids Aug. 10.

Reinforcing

Reinforcing Bar Prices, Page 65

New York — Reinforcing bar orders have been light over the past few days, although several sizable tonnages are active, including notably 4250 tons for the board of water supply, July 27. Six hundred and fifty tons are required for subway section C-A, route 110 Brooklyn, on which Rusciano & Son Corp. is low on the general contract and 260 tons for ramp connections (3500



You Can't Beat STARRETTS For This Job

Starrett Verniers have been the final authority on close inspection work for over half a century. Their sure accuracy and absolute dependability have won them a place in every well equipped tool crib . . . and the confidence of every skilled craftsman. New Starrett Catalog No. 26F describes and illustrates the complete line of Starrett Verniers as well as more than 3000 other fine precision tools. A copy free on request.

The tools shown above are
1. Starrett Vernier Caliper No. 122
2. Starrett Vernier Height Gage No. 454
3. Starrett Vernier Depth Gage No. 448
4. Starrett Steel Rule No. 410

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.

World's Greatest Toolmakers—Manufacturers of Hacksaws Unexcelled—Steel Tapes, Standard for Accuracy Dial Indicators for Every Requirement

Standardize on
STARRETT TOOLS
BUY THROUGH YOUR DISTRIBUTOR

Behind the Scenes with STEEL

Introducing . . .

■ The guy below is neither riding in our flivver nor does he have a hangover or a bad case of the jitters. As a matter of fact the gentleman is none other than "Mr. Exide", who is calmly but cleverly doing a publicity job for the fiftieth anniversary of the Electric Storage Battery Co. down in Philadelphia. A couple of clever gents, N. W. Goodwin and J. S. Gillespie, took the portraits of 67 employes in various departments of the company and combined them all into one portrait. They didn't retouch the final job one bit and

we must agree they've got something. It's surprising what a good looking fellow you can produce from the snub and hook noses and the slant and crossed eyes of 67 different mugs. Of course, "Mr. Exide" doesn't look any too happy but would you if you had 66 bedfellows, golf partners and bridge kibitzers whom you couldn't shake loose?

Tried & True

■ The athlete's foot remedy mentioned here a couple of weeks ago is manufactured by Gore Products down in New Orleans. You recall, we joshed them for sending us the same sales letter over and over for the last five years. Well, Mr. Gore joshes us right back to tell us that said letter is now running in its fifth million. What's more they've tried all sorts of trick folders, post cards and mailing pieces but they always come right back to the same old simple mimeographed letter which outpulls them all. Mr. Gore goes on to say that you have to work strictly on results in the mail order business and if you want repeats you must depend on the efficacy of your product. Well, STEEL's efficacy (and we had to look it up, too) is the ability to keep you right on top of every new development in the field and for that reason eight out of ten repeat year after year.

Trick Tapers

■ Manufacturing and selling twist drills is not as prosaic a business as one might imagine, judging from what President Read of Morse Twist Drill tells one of STEEL's eastern editors. Among the unusual requests coming to Morse was one during the Alaskan gold rush days for a hollow-center test drill for cutting down through frozen earth. This drill eliminated the back-breaking job of trying to find "pay dirt" by the pick-and-shovel-method. Another time, a farmer wanted a drill for cutting (of all things) the milk from caked cows. Morse turned out a hundred with gimlet handles and it is reported most of them are still in use. Believe it or not, tapered shank drills do not represent true tapers since the first ones were developed before the days of precision measuring instruments. Several companies now make drills with tapered shanks but all follow the original pattern. Parts made with precisely accurate tapered shank drills wouldn't fit the vast amount equipment in use today.

Add: WPA Stories

■ We guess by now nearly everyone has heard about the WPA worker who died from a heart attack and how the doctor had to examine 17 others before he discovered which one it was.

—SHRDLU

tons of shapes also involved), Westside elevated highway at Canal street, on which P. T. Cox, general contractor, is low. Prices continue easy.

Pittsburgh — Reinforcing steel projects continue to come out in good volume with placements carrying along at about the same rate. The price structure remains fairly firm with the new prices acting more as a floor under prices than a starting point for quotations. Sheffield Steel Corp., Kansas City, has received the award of 9000 tons for the Pensacola dam over Grand river, Oklahoma.

Cleveland — Requirements for reinforcing steel from private sources are limited to small miscellaneous tonnages, despite low prices now available. Public projects are slightly more active with considerable tonnage involved in the east approach of the new Main street bridge, Cleveland, and also for the Cloverleaf development near Brecksville, O.

Chicago — Outlook for better demand is fairly bright despite little change in business recently. Bids have been taken on about 550 tons of bars for state highway work, while a substantial tonnage will be required for local paving. A number of PWA jobs are in prospect here, but bar orders for this work will not be placed before fall.

Philadelphia — Pennsylvania highway department is taking bids Aug. 12 for road construction, including bridges in Westmoreland county requiring several hundred tons each. Several other public jobs are appearing which are expected to bolster low fabricators' backlogs. Inventories among most fabricators are reported low.

Seattle — Reinforcing materials are in slightly better demand and volume of sales is expected to increase as public projects develop. Largest tonnage pending is 4000 tons for Coulee dam; Bethlehem Steel is low. J. A. Terteling & Sons, Boise, Idaho, have the con-

Concrete Bars Compared

	Tons
Week ended July 23	**12,278**
Week ended July 16	**4,002**
Week ended July 9	**19,358**
This week, 1937	**8,026**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**6,189**
Weekly average, June	**4,957**
Total to date, 1937	**172,964**
Total to date, 1938	**185,685**

Includes awards of 100 tons or more.

tract at $239,406 for the Black Canyon, Boise, project, involving 415 tons concrete bars.

San Francisco — Only four projects calling for 100 tons or more of reinforcing bars were reported placed recently. The city of Los Angeles has just opened bids on 449 tons for five bridges. Awards totaled only 793 tons and brought the year's aggregate to 61,206 tons, compared with 51,430 tons last year.

Reinforcing Steel Awards

9000 tons, Pensacola dam, Grand river, Oklahoma, to Sheffield Steel Corp., Kansas City.

325 tons, Jeffrey section of supply company, Central Nebraska Public Power & Light Co., Hastings, Nebr., to Bethlehem Steel Co., Bethlehem, Pa.

310 tons, division KK, southwest sewage plant, Chicago, to Inland Steel Co., Chicago, through Joseph T. Ryerson & Sons, Chicago.

275 tons, flood wall and drainage structure, North Little Rock, Ark., to Jones & Laughlin Steel Corp., Pittsburgh, through Arkansas Foundry Co., Little Rock, Ark.

250 tons, high school, Wauwatosa, Wis., to Inland Steel Co., Chicago, through Joseph T. Ryerson & Sons, Chicago.

230 tons, bridge, Tulsa, Okla., to Sheffield Steel Corp., Kansas City, Mo.

225 tons, hotel at Juneau, Alaska, to Northwest Steel Rolling Mills, Seattle; A. W. Quist, Seattle, general contractor.

175 tons, bureau of reclamation, invitation B-47,131-A, Coram, Calif., to Bethlehem Steel Co., Los Angeles.

175 tons, river bank improvement, Minneapolis, to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, library, Fort Worth, Tex., through A. Farnell Blair, Lake Charles, La., general contractor, to Sheffield Steel Corp., Kansas City, Mo.

166 tons, four cottages, Sonoma State hospital, Calif., to Gunn, Carle & Co., San Francisco.

162 tons, Santa Clara river bridge, Los Angeles county, California, for state, to unnamed interest.

150 tons, high school, Iowa City, Iowa, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, factory, Ware Bros., Chicago, to Inland Steel Co., Chicago, through Joseph T. Ryerson & Sons, Chicago.

145 tons, bureau of reclamation, invitation, A-22,349-A, Mills, Wyo., to Colorado Fuel & Iron Co., Pueblo, Colo.

135 tons, Cottman avenue sewer, Philadelphia, to Taylor-Davis Inc., Philadelphia.

120 tons, post office and courthouse, Statesville, N. C., to West Virginia Rail Co., Huntington, W. Va., through A. Farnell Blair, Lake Charles, La., general contractor.

110 tons, Calumet intercepting sewer, contract 18-B, Chicago, to Republic Steel Corp., Cleveland, through O. J. Dean, Chicago.

Reinforcing Steel Pending

1200 tons, U. S. marine hospital, Boston; bids Aug. 16.

650 tons, subway section C-A, route 110, Brooklyn, Rusciano & Son Corp., New York City, low on general contract.

550 tons, bridge, Lee county, Dixon, Ill.

500 tons, building, Boston University, Boston.

415 tons (also 50 tons miscellaneous) Black Canyon canal, Boise project, Ida.; J. A. Terteling & Sons, Boise, general contractor; materials to be furnished by bureau of reclamation.

320 tons, bridges, Fairfield and Fairfield-Trumbull, Conn.; bids Aug. 1.

275 tons, building, veterans' hospital, Bedford, Mass.

250 tons, sewage disposal plant, Wyandotte, Mich.

250 tons, ramp connections, Westside elevated highway, Canal street, New York; P. T. Cox, that city, low on general contract, this project also requires 3500 tons of shapes, as noted in a previous issue.

242 tons, hospital, Lyons, N. J.; bids in

200 tons, officers quarters, Quantico, Va.; bids Aug. 1.

160 tons, highway work, Dauphin county, Pennsylvania; bids in.

150 tons, building, veterans' hospital, White River Junction, Vt.

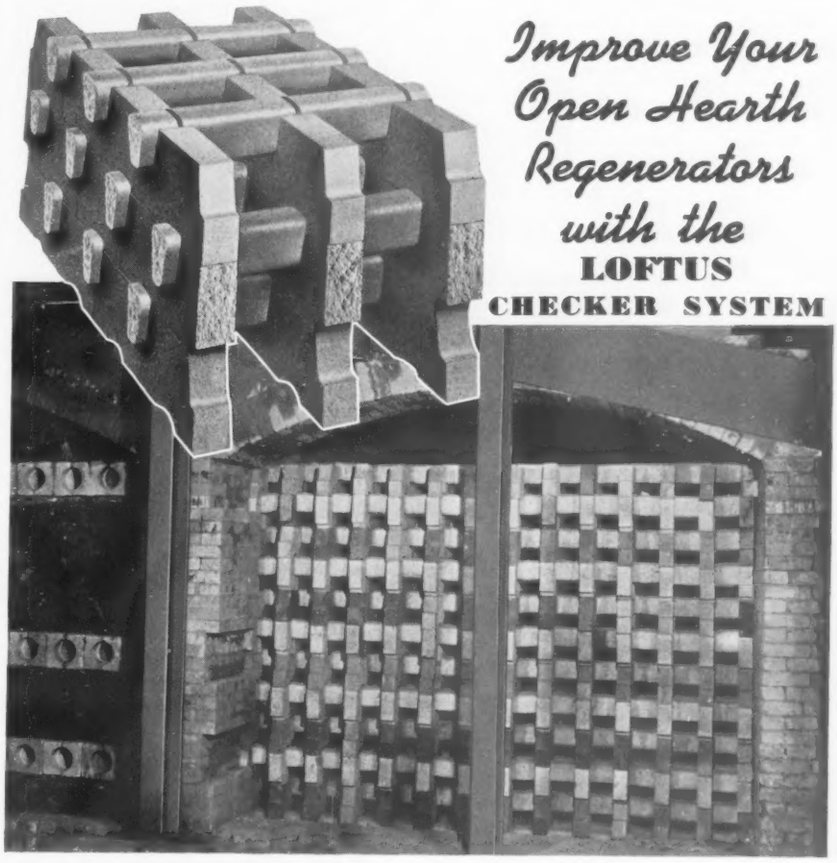
150 tons, Washington state highway projects; bids in at Olympia.

135 tons, highway, mostly mesh, Westerly, R. I.; bids in.

100 tons or more, 232 foot span, Linn county, Oregon; bids at Portland Aug. 4.

100 tons, Owyhee project unit; bids in at Boise, Ida.; materials by Bureau of Reclamation.

124 tons, Santa Ana river bridge, San Bernardino county, California, for state; bids July 28.



Improve Your Open Hearth Regenerators with the **LOFTUS CHECKER SYSTEM**

Without regeneration 90 percent of the available fuel input to an open hearth furnace would be lost.

The present installations of Loftus checker work exceed 12,500,000 9-inch equivalent, effecting worth while fuel savings.

The Loftus Checker System is furnished in Single-Pass, Multiple-Pass, and Underfed, Two-Pass designs.

The Two-Pass, Underfed design permits preheated air temperatures approximately 400 degrees higher than the conventional setting and incorporates facilities for cleaning the waste gas before passing through the checkers.

Our extensive experience in this specialized field and our engineering knowledge of the art, enables us to predetermine the performance of any regenerator setting and correct faulty designs and structures to permit longer life and lower fuel consumption.

We will be pleased to furnish on request, typical conversion layouts and information for modernizing your present regenerators.

LOFTUS ENGINEERING CORP.
509 OLIVER BUILDING PITTSBURGH, PA., U. S. A.

Here's why

CLEVELANDERS PREFER THE CLEVELAND ...AND WHY TRAVELERS AGREE WITH THEM •

★

A genuine interest in your comfort by everyone from manager to doorman.

Food that has made our four restaurants famous.

Deep beds, crisp linen, modern furnishings planned for comfort.

Gay music for dancing, or calm quiet if you prefer.

Convenience that saves time and money. Hotel Cleveland adjoins the Union Terminal and Terminal Garage, and is next door to everything you'll want to see in Cleveland.

HOTEL CLEVELAND Cleveland

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—Only slight improvement has appeared in pig iron demand here. Foundry activity is moderately heavier but business from non-integrated steel mills continues poor. Rumors of higher pig iron prices are discounted by producers, while buyers feel that they will be protected in the event higher levels should be instituted. Consequently, consumers have been in no hurry to place third quarter requirements.

Cleveland — Third quarter bookings continue to increase, but in the absence of gains in foundry operations, pig iron specifications against old contracts remain light. A slight decline in total deliveries this month is anticipated. Higher scrap prices have added fuel to the unconfirmed rumor that pig iron quotations will be advanced in the near future.

Chicago—Heavy buying of pig iron has subsided, with most consumers fairly well covered on third quarter needs. Releases against old contracts are heavier, and one producer estimates a gain of 40 per cent in July deliveries compared with June, provided recent gains continue until the end of this month. Foundries look for better operations during coming months and now are adding moderately to inventories. Recent rumors regarding a possible price increase in pig iron next month still are unconfirmed.

New York — Pig iron demand is quieter following its recent spurt. Consumers have yet to experience an appreciable pickup in call for castings, hence are taking iron for only immediate needs. Talk of a price advance in August has died down and most buyers now expect no revision before the opening of fourth quarter books, if then.

Philadelphia—Demand has moderated since the recent flurry that followed price reductions. Despite talk of higher prices foundries refrain from booking far ahead. The foundry melt has fallen behind the June rate, due partly to vacation shutdowns.

Buffalo — Heavier orders have yet to be reflected in pig iron shipments here. Foundries have placed substantial contracts to guard against any upward revision in prices, but are taking shipment on only limited lots to cover current needs. With a better outlook prevailing for foundry operations as a result of gains in inquiries for castings, pig iron sellers see better releases in the offing.

Cincinnati — Pig iron buying lately has been principally speculative, since specifications against contracts are about the same as before price changes. Melters anticipate heavier requirements during second half, however, and are anxious to be protected on prices, but as yet are unwilling to add materially to stocks.

Boston — Pig iron shipments are slightly heavier, but new spot buying is limited to scattered car-lot shipments. Some consumers are increasing stocks slightly, although foundry melt is unchanged. What small improvement in buying is done by moderate consumers financially in a position to take in more iron, with a view that the current price reduction provides a speculative reason for additional purchases.

St. Louis — Pig iron buying has dwindled following an active market the first half of July, at which time most consumers covered third quarter needs. While foundry operations are lighter than a month ago, due principally to seasonal reasons, shipments are well maintained and a small gain is indicated for the month as a whole. Machinery and engine builders have experienced a slight improvement in orders and inquiries, while stove plants expect to increase operations within the next two weeks. Jobbing foundries are running two to three days a week.

Birmingham, Ala.—With another blast furnace just blown in pig iron production has taken a sudden upswing. Resumption of Woodward Iron Company's No. 2 furnace came after announcement of the $4 reduction in price of pig iron. Stocks on hand have been considerably reduced by previously small orders.

Toronto,Ont.—New pig iron business has declined to about 1500 tons for the week. The slump is said to result from the fact melters are adequately stocked for the time being. Prospects are bright, however, and production is expected to continue only slightly below the level a year ago. New contracts for munitions are pending and are counted on to give further stimulus to raw material demand. Prices are firm.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh — Specifications for packers' cans are slightly heavier, and tin plate production has increased a trifle. Little change has occurred in general line can activity. In all lines buyers are restricting tin plate purchases, waiting to determine possibilities of a fall price revision. It is regarded as an even chance that a change will occur in

quotations next quarter. Tin plate operations now are 35 to 40 per cent.

New York — Tin plate demand for packers cans now is downward, and while requirements for general line containers are fairly steady, volume is only moderate. Possibility of lower tin plate prices upon the expiration of present contracts the end of September is causing consumers to buy cautiously. A marked upturn in steel operations by the end of this quarter and good prospects for future expansion, however, may cause tin plate prices to hold, in the opinion of some trade observers. Export demand continues light, little variation having been shown so far this summer.

Chicago—Tinplate operations here continue around 50 per cent. Demand is spotty and little improvement on any marked scale is in immediate prospect.

Scrap

Scrap Prices, Page 68

Pittsburgh — Scrap prices continue strong, with additional sales of No. 1 heavy melting steel to mills reported at $14.50. Large purchases are understood to have been involved. With mill stocks relatively light and operations increasing, additional buying is indicated. Recent consumer buying serves to consolidate the sharp enhancement in prices the past several weeks, but with scrap supplies light in some instances, further increases are regarded as not improbable. Railroad specialties and low phosphorus grades are quoted higher.

Chicago — Scrap prices scored a broad advance last week, raising No. 1 heavy melting steel $1 a ton at $12.50 to $13. Practically all other grades were marked up 50 cents or more under the influence of active bidding by dealers and brokers. Scrap is available in only limited amounts at current prices. Recently the shortage of available supplies has been accentuated by lightness of railroad offerings.

Boston — Scrap prices continue strong, advances being made in most cast grades. Heavy breakable is up 50 cents and No. 2 cast 25 cents to $10 and $8.25. These quotations are based largely on shipments to eastern Pennsylvania. Buying by New England consumers continues light. Some stove plate is also moving to Pennsylvania at $8.00. Heavy melting steel quotations for export continue to rise, one dealer quoting $11.50, dock, for No. 1, an advance of 50 cents, and paying $10.50 for No. 2.

New York—Export prices again have advanced, principal grades being up 50 cents. No. 1 heavy melting steel is $11.50, docks. Brokers' buying prices for domestic consumption are higher on heavy breakable cast, now $10.50 to $11, New York, while old steel shafting and stove plate also are higher. The stronger market is making holders of scrap reluctant to sell, and rising steel operations also contribute to a tight situation in supplies.

Philadelphia—Although no additional mill buying of No. 1 heavy melting steel has been reported brokers are paying $14 to $14.25, which justifies a quotation at that level. Other grades are also stronger, including No. 2 and cast grades, for steel mill and foundry consumption. Additional business in borings and turnings at $8, breakable cast at $15.50 is reported. Stove plate is holding on sales at $12.50 and $13. Market tone is still strong with many observers expecting $17 to be done on No. 1 steel this fall. Some take a more cautious view.

Buffalo—Despite absence of mill buying and inability of consumers and dealers to agree on prices, scrap quotations here continue strong, and No. 1 heavy melting steel has advanced another 50 cents a ton to $13 to $13.50. Brokers are having difficulty covering previous sales at less than the prevailing advanced range. A definitely stronger tone prevails, and the trade looks to expansion in steel production to stimulate activity and strengthen prices. The leading consumer here remains out of the market but still has about 5000 tons due on old orders.

Detroit—Scrap prices are sustained without the buying support of consumers, some of whom maintain that quotations are well above levels they are willing to pay. Supplies are light, a recent list of a body manufacturer totaling only ten cars. With new model production to begin next month, scrap offerings shortly will increase, and it is felt by some this will tend to weaken prices. Cast grades are easy, with some tonnages from here moving outside the state. Heavy melting steel is up 75 cents at $9.50 to $10.

Cincinnati — Dealers are active in bidding for scrap, while mills show little interest in grades other than No. 1 heavy melting steel and rail items. Old material is coming

CAUCASIAN MANGANESE Ore

MANGANESE Dioxide

•

HIGH GRADE METALLURGICAL ORE
Testing 52% Mn Also Other Grades

CAUCASIAN DIOXIDES of 85% MnO_2.
Also 80%. IRON below 1%.

Shipments f.o.b. Poti, BLACK SEA also c.i.f. ATLANTIC, U.S.A. PORTS

•

FIRST CLASS DONETZ ANTHRACITE AND COALS — Bunkering at Soviet Black Sea ports. Odessa, Novorossijsk, Poti, Nicolaev, Theodosia; also Mariupol, Leningrad.

Sole Exporters

SOJUZUGLEEXPORT

13, Armiansky Pereulok, Moscow Centre USSR
CABLES: UGLEEXPORT, MOSCOW
Apply to above or Amtorg Trading Corp., 261 Fifth Ave., New York City

out slowly, but higher bids of dealers are expected to attract more tonnages. Prices on most grades have been raised 25 to 50 cents a ton.

St. Louis — Sharp advances have carried iron and steel scrap prices 50 cents to $1 higher on most grades. The market is deriving most of its strength from strong bidding by brokers and dealers, since consumer demand is slow and no large pickup is in immediate prospect. Yard stocks of scrap generally are light, gathering and preparation having been curtailed somewhat by recent hot weather.

Birmingham, Ala. — Heavy melting scrap iron continues in moderately improved demand despite the pig iron price cut and the recent rise of No. 1 heavy melting from $11.50 to $12. No outstanding upturn, however, has been in evidence.

Seattle — The market is unusually dull. Japanese credits are increasingly difficult, local mills are not buying and foundry demand is small. In the absence of sales it is difficult to name prices. Tidewater stocks are low as interior shippers cannot cover costs under present conditions.

Toronto, Ont.—Demand is dull, buying being centered on a few special grades in which dealers are finding difficulty filling orders, due to a shortage of supplies. Heavy melting steel is active, and there is a fair call for turnings. Foundries continue in the market for cast scrap and stove plate. Dealers hope for an expanding market in the United States to unload surplus stocks of grades for which there is little or no demand here.

Warehouse

Warehouse Prices, Page 67

Cleveland — New quantity differentials instituted by warehouses here are similar to those in effect at various eastern centers and result in larger discounts on medium size orders for certain hot-rolled products. The new schedule follows: 400 to 1999 pounds, base; under 400 pounds, 50 cents extra; 2000 to 9999 pounds, less 20 cents; 10,000 to 39,999 pounds, less 30; 40,000 pounds and over, less 40. Quantity differentials on cold-rolled steel are unchanged. Business is slightly heavier, but July volume is expected to fall below June.

Chicago — While some decrease has occurred in sales since a week ago, which was the most active in several months, there are expectations that July business will be slightly above June's, contrary to this season's usual trend.

New York — Lower prices cause dollar volume so far this month to fall behind June, although in point of tonnage business is sustained. Orders have been slow to increase in all directions, but the trade is more optimistic regarding future months.

Philadelphia—Orders for warehouse steel are more numerous but continue small individually. July business is expected to show only a slight gain at best compared with June. Prices are reported none too stable, with a possibility of further reduction.

Buffalo — Lower prices tend to check the usual falling off in warehouse sales at this period. Distributors look for some decrease in July business, but the letdown is expected to be less severe than usual. Expansion in sales in August is anticipated.

Detroit — Business is slightly ahead of last month, with a few releases received for plant rehabilitation work in anticipation of new automotive model production. Latter activity is well below normal, and it appears expenditures general ly are being held in check.

Cincinnati — Warehouse sales are relatively active for this time of the year and better than was expected. Demand is principally from manufacturers, but some orders for construction material are appearing. Warehouses attribute a large share of recent gains in sales to lower prices.

St. Louis — Typical summer dullness prevails here, with business limited almost entirely to less carlot orders. Oil country material continues active, and the outlook for building products is brighter. Railroads are taking only small lots and are refraining from buying some items because of dissatisfaction with prices.

Seattle — Public works projects have resulted in an improved tone in the jobbing trade but buying continues in small tonnages out of stock. Mill business is light, no large orders pending. Prices are stable, although a new schedule has been issued to conform with readjustment of mill prices.

THE BEST KNOWN NAME IN IRON
HANNA
FOR 71 YEARS
. . . foundrymen have recognized Hanna quality as a standard for comparison. Such a reputation is especially significant today, when close adherence to specifications is so important.
NATIONAL STEEL
THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

Iron Ore

Iron Ore Prices, Page 68

New York— Rising steel production, while without effect on buying of foreign ore, is stimulating some interest among sellers. High grade manganese ore has been offered at 35 cents per unit, not including duty. Previously the market had been purely nominal at 45c. Sales are yet to be reported at the new figure, and consumers indicate that substantial stocks preclude new contracting until consumption has increased materially, probably to at least 50 per cent. Offerings are the lowest in many months, and whether actual transactions will be at still lower levels remains to be seen.

Cleveland — Lake Superior iron ore consumed by blast furnaces during June was 1,471,660 gross tons,

according to the Lake Superior Iron Ore association. This is slightly less than was consumed in the preceding month, and only 31.7 per cent of consumption in June, 1937. Stocks of iron ore at lower lake ports and furnaces July 1, were approximately 10,000,000 tons more than on the comparable date last year. Total ore on hand at lower lake ports and furnaces July 1 follow:

	Furnaces	Lake Erie docks	Total
July 1	29,159,617	5,169,606	34,329,223
Mo. ago	27,768,441	5,243,533	33,011,974
Year ago	21,065,726	3,329,253	24,394,979

The number of American lake ore carriers in commission July 15 was 126 compared with 116 June 15 and 312 July 15, 1937, according to figures compiled by M. A. Hanna Co., Cleveland. Only two of the 21 fleets are operating 100 per cent. The total number of American lake ore carriers is 308 making 40.9 per cent of the fleet active. The number of such carriers engaged in the ore trade is 92, compared with 88 in the preceding month and with 312 ships a year ago.

Steel in Europe

Foreign Steel Prices, Page 67

London—(*By Cable*)—Markets in Great Britain are inactive and consumers are curtailing deliveries in readiness for the annual holiday the first week in August. The undertone is more hopeful for a revival of demand in fourth quarter. Steelworks are operating a smaller number of shifts as specifications dwindle. Stocks of pig iron are heavy in all districts.

The Continent reports recent improvement is maintained but the volume of business is insufficient to satisfy works. Scrap imports into Germany during first half showed a heavy increase, chiefly from the United States.

Semifinished

Semifinished Prices, Page 65

Pittsburgh—Production of semifinished steel is heavier as a result of not only increased demand from nonintegrated mills but also the necessity of building up stocks of certain grades which had been permitted to decline the past few months. Sheet bars are substantially more active than a month ago, reflecting rising demand for flat-rolled steel. Skelp has been moving a little better the past few days, though orders remain small. Wire rod business is slow despite a slight upturn lately.

Chicago — Semifinished steel demand is slightly heavier, and production has been increased through the necessity of adding to mill inventories which recently have become depleted in certain analyses.

Ferroalloys

Ferroalloy Prices, Page 66

New York — Expansion in steelmaking leads to expectations of a gain in ferromanganese shipments this month. Meanwhile, prices are unchanged at $92.50, duty paid, tidewater. Domestic spiegeleisen is moving slightly better as a result of higher ingot production, with prices on 19 to 21 per cent holding at $28, Palmerton, Pa., and on 26 to 28 per cent at $33. While demand for ferroalloys generally is heavier, specifications still are far from brisk and in some grades business is unchanged.

Coke By-Products

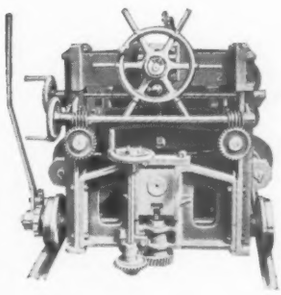
Coke By-Product Prices, Page 65

New York—Sulphate of ammonia demand is strong following introduction of a new pricing system which lowers the market for July shipment $3 a ton to $26.50, f.o.b. ports. The market will increase 25 cents each month up to and including January, when the price will be $28. The latter figure is scheduled to hold through the first half of 1939. Prices on other leading by-products are unchanged, although business in benzol and toluol is heavier and solvent naptha and industrial xylol are slightly more active. Phenol and naphthalene are quiet, with quotations unchanged.

Steel Imports Gain

Philadelphia—Imports of iron and steel products during the week ended July 16 were somewhat heavier. Shipments included 3002 tons of chrome ore from Africa, 40 tons of angles and 4 tons of bars from France; 9 tons of bars, 32 tons of steel tubing, 13 tons of steel forgings from Sweden; 10 tons of steel angles, 10 tons of steel bands, 34 tons of channels, 80 tons of shapes and 3 tons of steel bars from Belgium.

Federal Steel Sash Co., Waukesha, Wis., has purchased American rights to manufacture British Critall steel sash, and has taken over the equipment of the Critall Mfg. Co. Inc., Washington, heretofore exclusive

PUNCHES • SHEARS • SPACING TABLES
PRESSES • DIES • METAL-FORMING MACHINERY
BENDING AND STRAIGHTENING MACHINES • MULTIPLE DRILLS
THOMAS Angle Bevelers

View showing operating end
invaluable for ship work
Designed for beveling angles, channels, etc., an invaluable machine for the purpose. Built by an organization skilled in the building of fabricating machinery for widely varied types of industry. Write for complete information on Thomas fabricating and metal-forming equipment.
Let us quote on your requirements
THOMAS
MACHINE MANUFACTURING COMPANY
Name changed from Thomas Spacing Machine Co.
PITTSBURGH, PA.
FABRICATING MACHINERY

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

July	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot. N.Y.	Nickel Cathodes
16	9.75	9.87½	9.27½	43.20	43.50	4.90	4.75	4.75	20.00	11.25	35.00
18	9.75	9.87½	9.27½	43.10	43.40	4.90	4.75	4.75	20.00	11.25	35.00
19	9.75	9.87½	9.27½	43.35	43.60	4.90	4.75	4.75	20.00	10.75	35.00
20	9.75	9.87½	9.27½	43.50	43.75	4.90	4.75	4.75	20.00	10.75	35.00
21	9.75	9.87½	9.27½	43.40	43.65	4.90	4.75	4.75	20.00	10.75	35.00
22	9.87½	10.00	9.40	43.50	43.75	4.90	4.75	4.75	20.00	10.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.87½c Conn. copper

Sheets

*Yellow brass (high)	16.50
*Copper, hot rolled	18.00
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

*High, yellow brass	19.25
*Seamless copper	18.50

Rods

*High yellow brass	12.50
*Copper, hot rolled	14.50

Anodes

*Copper, untrimmed	15.25

Wire

*Yellow brass (high)	16.75

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.85-6.10
*Cleveland	6.75-7.00
*Chicago	5.75-6.00
*St. Louis	5.75-6.00

Heavy Copper and Wire

*New York, No. 1	7.62½-7.87½
*Cleveland, No. 1	7.50-7.75
*Chicago, No. 1	7.25-7.50
*St. Louis	7.00-7.25

Composition Brass Borings

*New York	5.35-5.60

Light Copper

*New York	6.10-6.25
*Cleveland	5.75-6.00
*Chicago	5.75-6.00
*St. Louis	5.50-5.75

Light Brass

*Cleveland	3.50-3.75
*Chicago	3.75-4.00
*St. Louis	3.50-3.75

Lead

New York	3.65-3.90
*Cleveland	3.50-3.75
Chicago	3.75-3.87½
St. Louis	3.50-3.75

Zinc

New York	2.00-2.12½
Cleveland	2.00-2.25
St. Louis	2.25-2.50

Aluminum

*Borings, Cleveland	5.25-5.50
*Mixed, cast, Cleveland	7.25-7.50
*Clips, soft, Cleveland	12.25-12.50
Mixed, cast, St. Louis	6.50-7.00

SECONDARY METALS

*Brass ingot, 85-5-5-5, less carloads	10.50
Standard No. 12 aluminum	13.25-13.50

ATTENTION... **Manufacturers and Shippers**

Move your factories or plants to the rivers ...You not only enjoy the low water rates, but also a lower rail rate.

•

CAMPBELL TRANSPORTATION COMPANY

THROUGH BARGE FREIGHT MOVEMENTS: PITTSBURGH, ST. LOUIS, NEW ORLEANS, HOUSTON, GALVESTON, AND INTERMEDIATE POINTS

GRANITE BUILDING, PITTSBURGH, PA.

American producer. The Federal company has changed its name to Critall-Federal Inc., and in addition to its line of commercial and industrial steel sash, will make domestic sash.

Nonferrous Metals

New York—Quietness of nonferrous metal markets was broken Friday by an advance of $2.50 per ton in the price of domestic copper following sustained strength in the foreign market. Export copper sold up to 10.10c. Lead, zinc and tin held steady to firm despite light buying.

Copper — Prices rose to 9.87½c, Connecticut, for electrolytic and to 9.40c, f.o.b. refinery, for casting copper while all allied products, including bare and magnet wire, brass and bronze ingots, rolled products, and red metal scrap advanced proportionately. Sales on Friday jumped to an estimated total of 5000 tons compared with a daily average of about 1130 tons for the first four days. Some sellers in both the domestic and export markets were still reticent at the higher levels.

Lead—Stocks of refined lead declined 377 tons last month, the first decline since last September. A further strengthening of the statistical position is expected this month. Fresh demand was in only moderate volume, reflecting the well covered position of consumers. Prices held very firm at 4.75c, East St. Louis.

Zinc—The 10-point rise in the galvanized sheet output rate to 42 per cent of capacity, a new high for the year to date, was a bullish development in the slab zinc market. Buying continued quiet, however, with prices steady at 4.75c, East St. Louis, for prime western.

Tin—Both the domestic and London markets continue to rise gradually and retain their gains rather well. American consumers continued to display a lack of buying interest, reflecting in part the low rate of tin plate production. Straits spot closed at 43.50c.

Activities of Steel Users and Makers

(*Continued from Page 27*)

valves from the Tata Iron & Steel Co., Jamshedpur, India. This order is in addition to the five goggle valves recently shipped to Tata by Brosius.

•

Campbell, Wyant & Cannon Foundry Co., Muskegon Heights, Mich.,

is installing a duplexing Lectromelt furnace for the manufacture of automotive cylinder irons. This furnace will have an hourly capacity of six tons and will be operated in connection with a continuous molding conveyor chain.

♦

Genesee Tool Co., Fenton, Mich., in addition to its line of dies, stampings and other production parts, is now offering a complete line of standard and special cutting tools, including turning and facing tools, standard side and plain milling cutters, alternate tooth cutters, circular saws, reamers, boring bars, involute gear cutters, etc.

♦

Armstrong Bros. Tool Co., Chicago; Apex Tool & Cutter Co., Shelton, Conn.; Pratt & Whitney Co., Hartford, Conn.; Davis Boring Tool division of Larkin Packer Co., St. Louis; Wendt-Sonis Drill Works, Hannibal, Mo.; Cole Carbide Industries, Detroit, and Genesee Tool Co. Inc., Fenton, Mich., have signed dealer contracts with Vascoloy-Ramet Corp., North Chicago, Ill.

♦

Lewis-Shepard Sales Corp., Watertown, Mass., has made the following new appointments to the list of representatives to handle its line of lift and floor trucks, portable elevators, skid platforms and other materials handling equipment: Wesley D. Low, P. O. box 1124, Knoxville, Tenn.; Industrial Supply Co., 121-131 Motor avenue, Salt Lake City, and J. W. Ralston Co., 1522 Fourth avenue, South, Seattle.

♦

Three trade school scholarships totaling $400 have been awarded by the school division of Allied Screw Machine Co., Chicago, to writers of the best essays on "The Importance of the Machinist and Tool and Die Maker to Industry." Winners are: Stanley B. Buck, Cicero, Ill., first; George Cobb, Chicago, second; George Sonneker, Chicago, third. Scholarships are for courses at Allied school.

Award Steel for World Fair Petroleum Building

■ Bethlehem Steel Co. will supply structural steel for the uniquely designed petroleum exhibit building under construction at the New York World's fair 1939. Contract calls for immediate fabrication of 600 tons, mainly beams, columns and trusses, for delivery early in August.

Building will form an equilateral triangle extending about 200 feet on each side and 80 feet high. Seventeen steel columns will support the structure; there will be no columns inside.

Steel trusses 11 feet, 2 inches deep and up to 89 feet in length will span the roof. Exterior walls will be corrugated metal.

Equipment

New York—Machine tool buying has lagged behind improvement in sentiment, but a few large orders have been placed. Included among these is equipment for a plant addition for Norma-Hoffmann Bearings Corp., Stamford, Conn. Wright Aeronautical Corp., Paterson, N. J., a consistent buyer of equipment for some time, has placed additional orders lately. Some small buying of production tools by automobile companies in the Middle West also is reported here. Export business includes sizable purchases by Japan, principally for aircraft production. Additional equipment for Japan now pending is expected to be placed as soon as financial arrangements are made. Russia is placing some orders, chiefly for aircraft work, but not in the volume noted last spring.

Cleveland — Machine tool and equipment orders are running ahead of June although still scattered and light. Most dealers and builders agree, however, the upturn will develop earlier than previously expected. Fair-sized orders have been placed by steel and metalworking companies for miscellaneous tools. Aircraft industry continues to order actively. Companies holding government contracts, the automotive and aircraft companies are the chief hopes of the trade for the next few weeks.

Chicago — Sales of plant equipment and machine tools have been low the past week. Machine tool interests report business dull but inquiries increased, reflecting better sentiment among consumers. Orders, however, are not materializing, although an increase in volume is anticipated shortly since many manufacturers are renewing activity. Some indication of this is gained through an increase in orders for repair parts such as blades and shears, showing machines again being used.

Seattle—Bids for heavy equipment at Coulee dam will be opened by bureau of reclamation at Denver Aug. 13, on Spec. 787 for three generators, each 108,000 kva, unity power factor, 120 rpm, 13,800 volts, 3-phase, 60-cycle, alternating current. Installation must be completed in 1050, 1140 and 1230 days. WPA, navy yard Puget Sound and Fort Lewis are calling for a miscellaneous list of items, including tools and building materials. Clark county, Washington, opens bids July 25 for a 10-ton roller and rock crusher. Buying by public bureaus has stimulated turnover. The lumber industry shows more activity and with plants reopening, replacement requirements are increasing.

STAMPINGS

SEAMLESS DRAWN

OUT OF 18-8 STAINLESS

It can be done as we are doing it every day.

If you have a job to be made of either ferrous or non-ferrous, submit it to us for quotation.

PRECISION METAL WORKERS
3100 CARROLL AVE. CHICAGO

Construction and Enterprise

Ohio

ALLIANCE, O.—Alliance Cold Storage & Packing Co. will rebuild portion of plant recently destroyed by fire.

CANTON, O.—Timken Foundation plans installation of motors and controls, conveyors, regulators and other equipment in new multi-story vocational high school. Cost about $1,000,000. Charles E. Firestone, 1324 Cleveland avenue, Northwest, Canton, is architect.

CLEVELAND—Advance Die & Tool Co., 6701 Peas avenue, is taking bids for one-story, 55 x 160-foot factory. Cost about $40,000.

CLEVELAND—Barth Stamping & Machine Works, 3815 West Thirty-fourth street, will spend about $40,000 for one-story addition to machine shop, with equipment. General contract has been let to Sam W. Emerson Co., 1836 Euclid avenue.

LEBANON, O.—Board of public affairs is considering improvements in municipal electric plant.

SANDUSKY, O.—City will vote on proposed municipal electric power plant at primary election in August. Estimated cost $1,500,000.

YOUNGSTOWN, O.—Youngstown Furnace Co. will build a one-story addition, 55 x 170 feet, for storage and distribution purposes, contract for which has been let to Felix Pesa & Son, Youngstown. Cost $50,000 with equipment.

Connecticut

DANBURY, CONN.—Board of education plans central heating plant in connection with new trade school; cost about $100,000. Harold F. Dow, superintendent of schools.

NEW HAVEN, CONN.—National Folding Box Co. has awarded contract to E. & F. Construction Co., New Haven, for extensions in power house at factory. Cost $50,000 with equipment.

New Hampshire

MANCHESTER, N. H.—H. K. Johnson, Pleasant street, has plans by A. W. Osberg, 508 Manchester street, and will soon take bids for one-story, 50 x 84-foot machine shop. Cost $40,000 including equipment.

Rhode Island

PROVIDENCE, R. I.—Del Rossi Macaroni Co., G. Del Rossi, 240 India street, plans rebuilding three-story factory recently destroyed by fire. Cost to exceed $40,000 with equipment.

New York

BATH, N. Y.—Bath Electric and Gas commission, A. J. Hamilton, chairman, plans addition to powerhouse, and will install two 300-kilowatt diesel powered generators. Cost $50,000 with equipment.

BRASHER FALLS, N. Y.—Town plans complete water supply system, to cost $70,000. William T. Field Engineering Co., Flower building, Watertown, N. Y., engineer.

SYRACUSE, N. Y.—Syracuse Container Corp. has plans by A. Goldsmith, architect, for erection of warehouse; cost will exceed $40,000.

WELLSVILLE, N. Y.—Sinclair Oil Co. sustained severe damage by fire to its refinery here last week.

New Jersey

HOBOKEN, N. J.—Delaware, Lackawanna & Western Railroad Co. will build an electrically-operated coaling station at Elmira, N. Y., terminal. Cost close to $35,000.

MILLTOWN, N. J. — Metalfield Inc., metal goods manufacturer, has leased a three-story building on Washington avenue, for manufacturing purposes.

NORTH BERGEN, N. J. — Rossotti Lithographing Co. Inc. will install complete air conditioning system in new plant at North Jersey industrial terminal. Cost with equipment, $100,000.

Pennsylvania

SCRANTON, PA.—Raker Paint Co., 850 Providence road, maker of paints, varnishes, oils, etc., plans building a one-story plant, to cost about $50,000 with equipment.

Michigan

FLINT, MICH.—Construction will be started soon on a new factory building for the recently incorporated Renaud Cosmetic Co.

GRAND RAPIDS, MICH. — Grand Rapids Sash & Door Co. is making improvements to its recently acquired plant in Lansing, Mich.

MILAN, MICH.—Bureau of prisons, department of justice, Washington, has appropriation of $90,000 for new steam power house at federal prison here, including boiler units and auxiliary equipment.

SAGINAW, MICH.—Lufkin Rule Co. plans expenditure of $40,000 for one-story addition, with equipment. Fred Beckbissinger, Saginaw, architect.

YPSILANTI, MICH.—Central Specialty Co. sustained severe damage by fire to a large section of its plant. Rebuilding operations will be started at once. Charles T. Watling is secretary.

Illinois

CHICAGO — Salerno-Megowen Biscuit Co., 4500 West Division street, plans one story, 80 x 325-foot bakery addition Cost $75,000.

CHICAGO—Peabody Coal Co., 231 South LaSalle street, plans new mechanical coal washing and cleaning plant at its Danville, Ill., properties. Estimated cost with machinery over $500,000.

CHICAGO—Keystone Metal Cabinet Co., 3912-14 North Elston avenue, plans one-story addition, 49 x 54 feet, costing about $40,000 with equipment. General contract has been let to John Duff, 300 South Lombard avenue.

Indiana

SHELBYVILLE, IND.—Cold Keep Storage Inc. will build one-story cold storage and refrigerating plant, 50 x 75 feet, to cost about $35,000 with equipment.

District of Columbia

WASHINGTON—Food and drug administration, department of agriculture, plans installation of motors and controls, regulators, conveyors and other equipment in new laboratory for pharmacology and vitamin work. Fund of $650,000 has been appropriated for project.

Kentucky

CORBIN, KY.—Has plans under way for expansion and improvements in municipal electric power plant, including installation of additional equipment to increase capacity. Fund of $350,000 is being arranged. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

Florida

FORT LAUDERDALE, FLA. — Port Everglades Refrigerating Co. has leased tract of land for expansion in cold storage and refrigerating plant for which plans are being prepared. Additional equipment will be purchased.

JACKSONVILLE, FLA.—PWA grant of $1,127,000 has been approved of an estimated cost of $2,503,000 for constructing additions and improvements to municipal electric generating plant and dis-

tribution system. An additional boiler, turbine and auxiliaries of 25,000-kilowatt capacity, and heat reclaiming equipment will be installed, and new substations will be built.

Georgia

ATHENS, GA.—Fickett Cotton Mills Inc., care of R. N. Fickett and H. Hurdin, Athens, plans altering and purchasing machinery for recently acquired Whitehall Mill property. Cost $275,000.

ATLANTA, GA.—Georgia Power Co. has plans maturing for extensions and improvements in local steam-electric generating plant on Butler street, and will begin work soon. Additional equipment will be installed. Bids have been asked for building alterations.

Mississippi

STARKVILLE, MISS.—City receives bids Aug. 3 for furnishing labor and materials and construction of electric distribution system. Estimated cost $84,000. A. S. Brumby, consulting engineer.

Missouri

COLUMBIA, MO.—Approval has been given PWA grant of $488,250 of an estimated cost of $1,085,000 for constructing three buildings, remodeling two existing buildings and additions to power plant and waterworks.

ST. LOUIS—Cole Chemical Co. Inc., 3721-27 Laclede avenue, plans erection of two-story plant, 30 x 100 feet, costing close to $100,000 with equipment.

ST. LOUIS—American Refrigerator Transit Co., subsidiary of Missouri Pacific lines and the Wabash Railway Co., will begin construction of new car shops here within two weeks. The new buildings and machinery will cost between $200,000 and $300,000.

VANDALIA, MO.—W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, has been engaged to make survey and prepare plans for municipal electric power plant. Cost $165,000.

Oklahoma

BLACKWELL, OKLA.—Approval has been given PWA loan of $115,000 and grant of $92,000 of an estimated cost of $207,000 for constructing an addition to existing power house with crane, installing 4000-kilowatt steam turbine generator with appurtenances.

Wisconsin

HUDSON, WIS.—Leck Construction Co., 211 South Eleventh street, Minneapolis, is low bidder on erection of industrial building, 120 x 340 feet, to be built by city for occupancy of manufacturer, name withheld, to move to Hudson. Cost is estimated at $150,000. W. R. Foss is city clerk.

MILWAUKEE—A. J. Lindemann & Hoverson Co., maker of stoves, ranges, etc., has received RFC loan of $450,000 to retire bank loans of $340,000 and employ remainder for plant modernization, including some new equipment.

MILWAUKEE—County board has purchased two-acre factory site at North Sixty-third and West State streets for proposed new $75,000 highway department garage and service station. W. F. Cavanaugh is county highway commissioner.

OSHKOSH, WIS.—Hudson Mfg. Co., Minneapolis, maker of metal products for farm, home and other similar purposes, with local factory at 80 Harrison street, will build a factory addition here according to plans by Auler, Jensen & Brown, local architects.

STEVENS POINT, WIS.—Henry Grams and Addison Berwick have formed the firm of Grams & Berwick Inc., to conduct a general machine shop business.

Minnesota

DULUTH—City, C. D. Jeronimus, city clerk, has selected Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, to draw plans for sewage disposal plant costing $1,166,000. T. L. McGilvray is city engineer. PWA has approved $524,700 grant.

FERGUS FALLS, MINN.—REA has allotted $252,000 to the Lake Region Co-operative Electrical association, J. S. Tully, superintendent, for the construction of 242 miles of rural transmission lines.

JACKSON, MINN.—Federal Rural Electric association, P. L. Ferguson, superintendent, has applied to REA for loan to construct 255 miles of transmission lines in Jackson, Martin, Nobles and Cottonwood counties.

JORDAN, MINN.—REA has allotted $251,000 to the Minnesota Valley Electric Co-operative, John Haugh, superintendent, for the construction of 218 miles of rural transmission lines.

LITCHFIELD, MINN.—REA has allotted $165,000 to Meeker Co-operative Light & Power association, I. J. Clinton, superintendent, to construct 144 miles of transmission lines in Meeker, Stearns, Kandiyohi and Renville counties.

MONTEVIDEO, MINN.—REA has allotted $288,000 to the Minnesota Valley Co-operative Light & Power association, E. L. Smith, president, to build 288 miles of transmission lines in Chippewa, Yellow Medicine and LaQuiParle counties.

PRINCETON, MINN.—City, B. R. Whitney, city clerk, is preparing preliminary plans and will hold bond election soon for municipal power plant costing $120,000. Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, are consulting engineers.

ST. JAMES, MINN.—REA has allotted $271,000 to the South Central Electric association, Edward C. Meier, superintendent, to construct 248 miles of transmission lines.

Texas

CUERO, TEX.—Presidential approval has been given PWA grant of $101,000 of an estimated cost of $225,000 for constructing electric generating plant and distribution system.

EDINBURG, TEX.—Spreckles Sugar Co., 2 Pine street, San Francisco, plans installation of motors and controls, conveyors, regulators, electric hoists and other equipment in proposed new beet sugar mill near here. Power house and pumping station will be built. Cost $1,000,000. (Noted July 11).

HOUSTON, TEX.—Olympic Engineering Co. of Texas, 7402 Navigation boulevard, producer of mechanical specialties, liner hangers for packers, will erect a one-story plant, costing over $50,000 with equipment.

Kansas

LARNED, KANS.—City council will spend approximately $100,000 for extensions and improvements in municipal electric power plant, including additional equipment. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

Iowa

DAVENPORT, IOWA—Red Jacket Mfg. Co., 2527 Rockingham road, maker of pumping machinery and parts, has let general contract to Preister Construction Co., Davenport, for one-story addition. Cost close to $40,000 with equipment.

EMMETSBURG, IOWA—City, Mrs. Ida G. Sands, city clerk, has filed application with PWA for grant to construct sewage disposal plant at cost of $58,675. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

PLANT AVAILABLE...

AN UNUSUAL OPPORTUNITY

ONE of our clients has asked us to arrange an interview with some manufacturer seeking a new location for his plant.

This client has available a large factory building which is being offered under most attractive conditions.

Located within a vastly rich market, and immediately close to the source of a wide variety of raw or basic materials, the offer represents an unusual opportunity.

This opportunity was created because of a consolidation of plant facilities and operations of the present owner. Sale, lease or rental of all or part of the property may be discussed in a preliminary interview, which can be arranged. A combination of circumstances makes this opportunity unusual from many standpoints and well worth your inquiry if you are considering a new location or expansion of your present facilities.

CAMPBELL-SANFORD ADVERTISING CO.

601 Farley Building - Cleveland, Ohio

Wyoming

COKEVILLE, WYO.—City, Frank J. Jones, mayor, has filed application with PWA for grant to construct waterworks plant to cost about $53,907.

GILLETTE, WYO.—City, Robert L. Streeter, city engineer, has filed application with PWA for grant to construct three wells and waterworks plant at total cost of $142,000.

Montana

HUNTLEY, MONT.—REA has allotted $144,000 to the Yellowstone Valley Electrification association, J. E. Pickens, president, to construct 128 miles of rural transmission lines in Yellowstone, Carbon and Stillwater counties.

SIMMS, MONT.—REA has allotted $74,000 to the Sun River Electrification association, S. F. Hockensmith, president, to construct 74 miles of rural transmission lines in Teton and Cascade counties.

Pacific Coast

BURBANK, CALIF.—Construction will start Aug. 1 on a new hangar at the plant of Lockheed Aircraft Corp., to cost $140,000. It will be the first unit in an expansion program to provide additional factory floor space.

LOS ANGELES—Building permit has been issued to Stephens-Adamson Mfg. Co., 2227 East Thirty-seventh street, machinery manufacturer, to construct a crane runway, 40 x 125 feet, to cost about $4000.

LOS ANGELES—Superior Tank Construction Co., 4735 East Fifty-second street, will erect a new factory building at 6185 Eastern avenue, 115 x 150 feet. The new structure, including a crane runway, will cost about $16,000.

LOS ANGELES—Southern California Gas Co., 950 South Broadway, plans new office building, distributing unit and warehouse at Visalia, Calif., and also reconstructing office building and distribution unit at Wasco, Calif. Cost $40,000 or more.

SACRAMENTO, CALIF.—Acme Pipe & Machinery Co. has been established on North Sixteenth street, by J. S. Steinberg.

SAN FRANCISCO—Pacific Gas & Electric Co. has filed plans for new one-story indoor power substation at West terminal of Key System and will proceed with construction at once. Cost over $75,000 with transformers, switchgear and accessory equipment.

KLAMATH FALLS, OREG.—Klamath Ice & Storage Co. will make extensions in building now occupied by Pacific Fruit & Produce Co. and will convert and expand into cold storage division, with installation of new equipment. A new one-story building is being erected for the latter firm.

OLYMPIA, WASH. — Olaf L. Olsen, state director, has called bids July 29 for boiler and equipment of first unit of central heating and power plant for new school buildings at Buckley, a $500,000 project.

SEATTLE—City will take bids Aug. 11 for proposed $275,000 sewage treatment plant. Materials required include steel tanks, concrete pipe, large pumping unit, etc.

SEATTLE—Interior department, Washington, will open bids Aug. 31 for heating, plumbing equipment and electric generating plant for government hospital to be erected at Bethel, Alaska.

SPOKANE, WASH.—Columbia Tungsten Corp., 501 City Hall building, has been organized by A. H. Albin and associates, with capital of $100,000.

SPOKANE, WASH.—B. V. Hole and associates, Cut Bank, Mont., have acquired the R. K. Neill refinery and will recondition it at a cost of $35,000. Storage tanks with capacity of 500,000 gallons will be installed.

Canada

FORT WILLIAM, ONT.—Kaministiguia Power Co. Ltd. plans extension of power plant at Kakabeka Falls. H. L. Sanborn, care of owner, is engineer.

MONTREAL, QUE.—Chromium Mining & Smelting Co. Ltd., Canadian Bank of Commerce building, Hamilton, plans constructing ore smelter and will purchase machinery. Estimated cost $1,000,000.

MONTREAL, QUE.—British American Tobacco Co. of England plans to build a plant near Three Rivers, Quebec, to manufacture aluminum foil used in cigarette-making. The building will cost $400,000, while machinery and equipment will cost about $800,000. Construction work will begin shortly.

ST. EUGENE de GRANTHAM, QUE.—L. Desmarais plans saw mill, sash and door factory. Cost with equipment $40,000. Maturity in fall.

"It is a Raymond policy to investigate new materials and methods which appear to promise improved spring performance"

RAYMOND SPRINGS
DIVISION OF ASSOCIATED SPRING CORPORATION
RAYMOND MFG. CO., CORRY, PA.

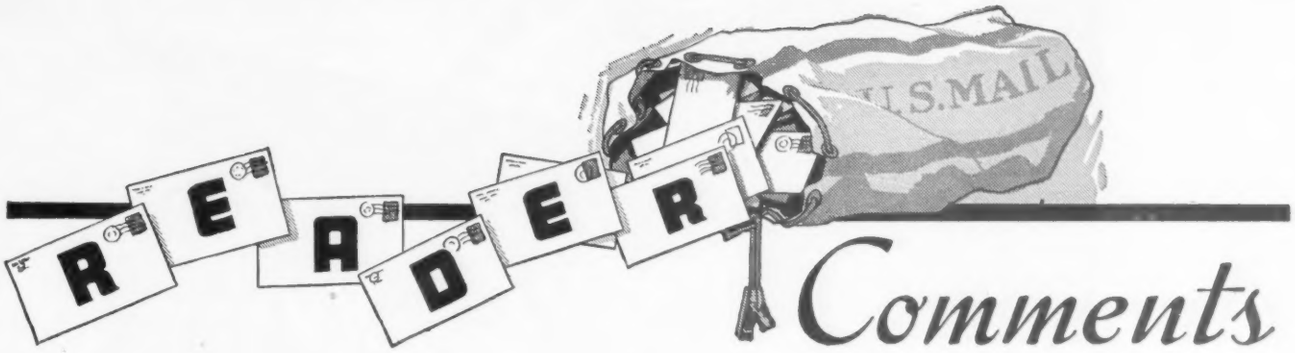
SCREENS of Perforated Metal

The Harrington & King PERFORATING Co.
5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.

CROSBY FOR STAMPINGS

All our efforts have been concentrated on one product - - STAMPINGS - - for more than 40 years. We have made stampings, deep, intricate, heavy, light, large and small, for nearly every branch of industry.

THE CROSBY COMPANY
Buffalo, N. Y.



Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Who Benefits?

To the Editor:

All men of industry and all stockholders realize (by necessity) the tremendous increase in the tax burden in the past seven years. Additional and definite information on the problem is provided by a recently completed study by the American Federation of Investors Inc., Chicago.

The study covers 150 representative corporations. Its purpose is to reveal how taxes have curtailed "the purchasing power of millions of thrifty citizens, investors and workers."

Findings of the survey:

Taxes paid by the 150 companies in 1937 totaled $1,631,000,000—more than twice the amount paid in 1932.

Total taxes paid amounted to an average of $2.62 per common share; total dividends paid by the same companies averaged $1.95 per common share.

Taxes in 1937 for the companies covered in the survey averaged $291 per common shareholder, and $514 per employe.

For 143 companies, 1937 taxes were $1,494,484,398; 1936 taxes amounted to $1,258,438,606, indicating an increase of about 20 per cent in one year.

For 124 companies, 1937 taxes were $1,422,670,853; for 1932, they were $681,648,286, indicating an increase of 109 per cent.

How taxes overshadowed dividends to common shareholders: United States Steel Corp. paid $10.11 in taxes per common share, compared with $1 in dividends; Bethlehem Steel Co. paid $6.18 in taxes and $5 in dividends; Republic Steel Corp. paid $1.60 in taxes and no common dividends.

Taxes are rigid; prices are competitive; and profits are uncertain.

Mr. Editor, who benefits by industry?

SMALL STOCKHOLDER

Youngstown, O.

An Engineer's Viewpoint

To the Editor:

I have read with great interest your editorial on "The Regimentation of Steel" (STEEL, June 20, p. 35). You certainly admitted the truth when you said "the steel industry has only itself to blame for the unfavorable position it now occupies in public esteem."

I want to ask you what else could be expected when we have officers at the heads of some steel companies whose fathers paid their way through school and who never did a real day's work in their lives. I am thinking of the times, when as a millwright, I frequently was on duty 36 hours at a stretch. I worked up from the laboring gang to chief engineer and I know what I am talking about. I never had any trouble with men striking when they worked for me, because I had done the work myself and knew how to treat my men. It is not necessary to drive them like animals.

They took as much as $3 a month out of my pay for their "relief" for nearly 50 years and then laid me off before I was 60 to save giving me a pension.

The last job I was on I had to make all the layout, and after I got the thing worked out the chief would take it away from me and give it to one of his friends who would make a few changes, redraw it and get the credit for doing all of it.

About three years ago a chief engineer at a certain plant sent me a telegram asking me to come at once ready to go to work. When I arrived there he let me sit all forenoon while he hired three applicants who couldn't talk English. Then he told me he could not use me. I sent the head of the company a bill for $20 expenses which he never paid me, and yet he gets up on his hind legs and with tears in his eyes says President Roosevelt is abusing him.

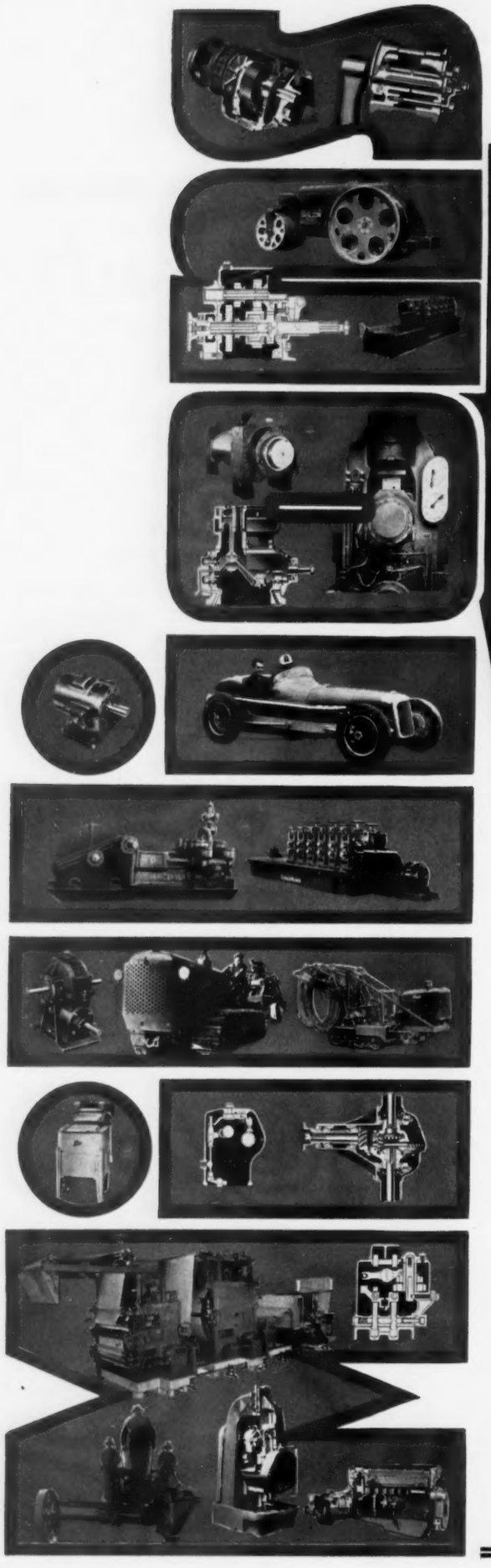
I was on a job where they worked us every day including Sundays and three nights a week overtime until 11 o'clock. We were nearly dead at the end of ten months when the job was completed and all of us were laid off. The mill has run very little since. They could have given twice as many men work and had a much better job if they had taken more time.

That was why I urged the wage-hour bill which the President has just signed. I have always been a rock-ribbed Republican but Roosevelt has tried to do more for the working class of people than any other president we have ever had, but it has been prevented from working out the way he intended it should. The old-age pension, social security and wage-hour bills are the best laws ever passed for both the companies and their men, but they must be changed some to suit different conditions.

I am bitterly opposed to labor unions. A man is much worse off when he has to join them than he would be if there were no unions. When I was assistant chief engineer on a large construction job where we had more than 2000 men they all were compelled to give $40 to join the union and $2 a day for room and meals in the "bunkhouse."

The contractor would keep them until they caught up with their dues

(*Please turn to Page* 30)



In Service "PERFECT" OIL SEALS

CHICAGO RAWHIDE MANUFACTURING CO.

1308 ELSTON AVENUE, CHICAGO, ILLINOIS

60 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA CLEVELAND NEW YORK DETROIT
BOSTON PITTSBURGH CINCINNATI